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TRANSACTIONS

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS.

VOL. XVI.

FOR THE YEAR 1903.

NEW YORK:

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1904

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NOTE.

The Association does not hold itself responsible for the views enunciated in the papers and discussions published in this volume.

WILLIAM WARREN POTTER, *Secretary*,
284 FRANKLIN STREET, BUFFALO.

[Minutes and discussions stenographically reported by WILLIAM WHITFORD, Chicago, Ill.]

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CONSTITUTION AND BY-LAWS

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS,

TOGETHER WITH

MINUTES OF THE SIXTEENTH ANNUAL MEETING.

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AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS.

CONSTITUTION.

I. The name of this Association shall be THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

II. Its object shall be the cultivation and promotion of knowledge in whatever relates to Abdominal Surgery, Obstetrics, and Gynecology.

MEMBERS.

III. The members of this Association shall consist of Ordinary Fellows, Honorary Fellows, and Corresponding Fellows.

The Ordinary Fellows shall not exceed one hundred and fifty in number.

The Honorary Fellows shall not exceed ten American and twenty-five foreign.

Candidates shall be proposed to the Executive Council at least one month before the first day of meeting, by two Fellows, and shall be balloted for at the annual meeting, a list of names having been sent to every Fellow with the notification of the meeting.

A two-thirds vote in the affirmative of all the members present shall be necessary to elect—fifteen Fellows at least being in attendance.

All candidates for active fellowship shall submit to the Executive Council at least one month before the annual meeting, an original paper relating to Abdominal Surgery, Obstetrics, or Gynecology.

HONORARY FELLOWS.

IV. The power of nominating Honorary Fellows shall be vested in the Executive Council.

Their election shall take place in the same manner as that of Ordinary Fellows.

They shall enjoy all the privileges of Ordinary Fellows, excepting to vote or hold office, but shall not be required to pay any fee.

CORRESPONDING FELLOWS.

V. The Corresponding Fellows shall be recommended by the Executive Council and elected by the Association.

They shall enjoy all the privileges of Ordinary Fellows, excepting to vote or hold office, and shall be entitled to a copy of the annual TRANSACTIONS.

They shall pay an annual fee of five dollars.

OFFICERS.

VI. The officers of this Association shall be a President, two Vice-Presidents, a Secretary, a Treasurer, and six Executive Councillors.

The nomination of all officers shall be made in open session at the business meeting, and the election shall be by ballot.

The first five officers shall enter upon their duties immediately before the adjournment of the meeting at which they shall be elected, and shall hold office for one year.

["At the election next succeeding the adoption of these laws, the full number of Executive Councillors shall be elected; two for a term of three years, two for a term of two years, and two for a term of one year.

"At every subsequent election two Councillors shall be elected for a term of three years, and shall continue in office until their successors shall have been elected and shall have qualified."][1]

Any vacancy occurring during the recess may be filled temporarily by the Executive Council.

ANNUAL MEETINGS.

VII. The time and place of holding the annual meeting shall be determined by the Association or may be committed to the Executive Council each time before adjournment.

It shall continue for three days, unless otherwise ordered by vote of the Association.

[1]Amendment adopted September 21, 1898.

AMENDMENTS.

VIII. This Constitution may be amended by a two-thirds vote of all the Fellows present at the annual meeting: *provided,* that notice of the proposed amendment shall have been given in writing at the annual meeting next preceding: and *provided, further,* that such notice shall have been printed in the notification of the meeting at which the vote is to be taken.

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS.

BY-LAWS.

THE PRESIDING OFFICER.

I. The President, or in his absence one of the Vice-Presidents, shall preside at all meetings, and perform such other duties as ordinarily pertain to the Chair.

The presiding officer shall be *ex-officio* chairman of the Executive Council, but shall vote therein only in case of a tie.

SECRETARY.

II. The Secretary shall attend and keep a record of all meetings of the Association and of the Executive Council, of which latter he shall be *ex-officio* clerk, and shall be entitled to vote therein.

He shall collect all moneys due from the members, and shall pay the same over to the Treasurer, taking his receipt therefor.

He shall supervise and conduct all correspondence of the Association; he shall superintend the publication of the TRANSACTIONS under the direction of the Executive Council, and shall perform all the ordinary duties of his office.

He shall be the custodian of the seal, books, and records of the Association.

TREASURER.

III. The Treasurer shall receive all moneys from the Secretary, pay all bills, and render an account thereof at the annual meetings, when an Auditing Committee shall be appointed to examine his accounts and vouchers.

EXECUTIVE COUNCIL.

IV. The Executive Council shall meet as often as the interests of the Association may require. The President, or any three members may call a meeting, and a majority shall constitute a quorum.

It shall have the management of the affairs of the Association, subject to the action of the house at its annual meetings.

It shall have control of the publications of the Association, with full power to accept or reject papers or discussions.

It shall have control of the arrangements for the annual meetings, and shall determine the order of the reading of papers.

It shall constitute a court of inquiry for the investigation of all charges against members for offences involving law or honor; and it shall have the sole power of moving the expulsion of any Fellow.

ORDER OF BUSINESS.

V. The Order of Business at the annual meetings of the Association shall be as follows:

1. General meeting at 10 o'clock A.M.
   - *a.* Reports of Committees on Scientific Questions.
   - *b.* Reading of Papers and Discussion of the same.
2. One Business Meeting shall be held at half-past nine o'clock A.M. on the first day of the session, and another on the evening of the second day (unless otherwise ordered by vote), at which only the Fellows of the Association shall be present. At these meetings the Secretary's Record shall be read; the Treasurer's Accounts submitted; the Reports of Committees on other than scientific subjects offered; and all Miscellaneous Business transacted.

PAPERS.

VI. The titles of all papers to be read at any annual meeting shall be furnished to the Secretary *not later* than one month before the first day of the meeting.

No paper shall be read before the Association that has already been published, or that has been read before any other body.

Not more than thirty minutes shall be occupied in reading any paper before the Association.

Abstracts of all papers read should be furnished to the Secretary at the meeting.

All papers read before the Association shall become its sole property if accepted for publication; and the Executive Council may decline to publish any paper not handed to the Secretary *complete* before the final adjournment of the annual meeting.

QUORUM.

VII. The Fellows present shall constitute a quorum for all business, excepting the admission of new Fellows or acting upon amendments to the Constitution, when not less than fifteen Fellows must be present.

DECORUM.

VIII. No remarks reflecting upon the personal or professional character of any Fellow shall be in order at any meeting, except when introduced by the Executive Council.

FINANCE.

IX. Each Fellow on admission shall pay an initiation fee of twenty-five dollars, which shall include his dues for the first year.

Every Fellow shall pay *in advance* (*i.e.*, at the beginning of each fiscal year) the sum of twenty dollars annually thereafter.

[A fiscal year includes the period of time between the first day of one annual meeting and the first day of the next.]

Any Fellow neglecting to pay his annual dues for two years may forfeit his membership, upon vote of the Executive Council.

The Secretary shall receive annually a draft from the President drawn on the Treasurer for a sum, to be fixed by the Executive Council, for the services he shall have rendered the Association during the year.

A contingent fund of one hundred dollars shall be placed annually at the disposal of the Secretary for current expenses, to be disbursed by him, and for which he shall present proper vouchers.

ATTENDANCE.

X. Any Fellow who shall neither attend nor present a paper for three consecutive years, unless he offer a satisfactory excuse, may be dropped from fellowship upon vote of the Executive Council.

RULES.

XI. *Robert's Rules of Order* shall be accepted as a parliamentary guide in the deliberations of the Association.

AMENDMENTS.

XII. These By-Laws may be amended by a two-thirds vote of the Fellows present at any meeting; *provided,* previous notice in writing shall have been given at the annual meeting next preceding the one at which the vote is to be taken.

OFFICERS FOR 1903-1904.

PRESIDENT.

WALTER BLACKBURN DORSETT, St. Louis.

VICE-PRESIDENTS.

AARON BENJAMIN MILLER, Syracuse.
WILLIAM DAVID HAGGARD, Nashville.

SECRETARY.

WILLIAM WARREN POTTER, Buffalo.

TREASURER.

XAVIER OSWALD WERDER, Pittsburg.

EXECUTIVE COUNCIL.

EDWIN RICKETTS, Cincinnati.
WALTER BENAJAH CHASE, New York.
ALBERT VANDER VEER, Albany.
LEWIS SAMUEL McMURTRY, Louisville.
LEHMAN HERBERT DUNNING, Indianapolis.
RUFUS BARTLETT HALL, Cincinnati.

HONORARY FELLOWS.

*Deceased.

1899.—BALLANTYNE, JOHN WILLIAM, M.D., F.R.C.P.E., F.R.S. Edin. Lecturer on Midwifery and Gynecology, School of the Royal College, Edinburgh; Examiner in Midwifery and Gynecology in the University of Edinburgh; Vice-President of the Edinburgh Obstetrical Society; Honorary Fellow of the Glasgow Obstetrical and Gynecological Society. 24 Melville Street, Edinburgh, Scotland.

1889.—BANTOCK, GEORGE GRANVILLE, M.D., F.R.C.S. Ed. Surgeon to the Samaritan Free Hospital. Upper Hamilton Terrace, London, N. W., England.

1889.—BARBOUR, A. H. FREELAND, M.A., B.S.C., M.D., F.R.C.P. Ed., F.R.S. Ed. Lecturer on Midwifery and Diseases of Women in the Edinburgh Medical School; Assistant Physician to the Royal Maternity Hospital; Assistant Physician for Diseases of Women to the Royal Infirmary; Physician to the Women's Dispensary; Fellow of the Edinburgh and London Obstetrical Societies, and of the British Gynecological Society; Corresponding Fellow of the Royal Academy of Medicine, Turin. 4 Charlotte Square, Edinburgh, Scotland.

1892.—*BOISLINIÈRE, L. Ch., A.B., M.D., LL.D. St. Louis, Mo. 1896.

1890.—CHAMPIONNIÈRE, JUST. LUCAS, M.D. 3 Avenue Montaigne, Paris, France.

1889.—*CHARPENTIER, LOUIS ARTHUR ALPHONSE, M.D. Paris, France. 1899.

1888.—CORDES, AUGUST ELISÉE, M.D. Member of the Royal College of Physicians, London; Fellow of the Obstetrical Society of London and of the British Gynecological Society; Corresponding National Member of the Obstetrical and Gynecological Society of Paris; Honorary Fellow of the Detroit Gynecolog-

ical Society; late "Chirurgien-adjoint" of the Obstetrical and Gynecological Clinic at the Maternity at Geneva; Consulting Accoucheur of the Miséricorde Hospital, etc.; Perpetual Member of the Société Obstétricale de France, Paris, France. 12 Rue Bellot, Geneva, Switzerland.

1890.—*CORSON, HIRAM, M.D. 1896.

1889.—CROOM, SIR J. HALLIDAY, M.D., F.R.C.P.E., F.R.C.S.E., F.R.S.E. Physician to and Clinical Lecturer on Diseases of Women, Royal Infirmary, Edinburgh; Physician to the Royal Maternity Hospital; Lecturer on Midwifery and the Diseases of Women at the School of Medicine; Consulting Physician for Diseases of Women, Western Dispensary. 25 Charlotte Square, Edinburgh, Scotland.

1889.—*DUNLAP, ALEXANDER, A.M., M.D. Springfield, O. 1894.

1888.—*EDIS, ARTHUR WELLESLEY, M.D. Lond., F.R.C.S., M.R.S.C.S. London, England. 1893.

1889.—*EKLUND, ABRAHAM FREDRIK, M.D. Stockholm, Sweden. 1898.

1891.—FERNANDEZ, JUAN SANTOS, M.D. Calle de la Reina, No. 92, Havana, Cuba.

1891.—*FISHER, GEORGE JACKSON, A.M., M.D. Sing Sing, N. Y. 1893.

1889.—FREUND, WILLIAM ALEXANDER, M.D. Professor and Director of the Clinic for Diseases of Women in the University of Berlin. Kleiststrasse 5, Berlin W., Germany.

1896.—*GASTON, JAMES MCFADDEN, A.M., M.D. Atlanta, Ga. 1903.

1892.—*GREEN, TRAILL, M.D., LL.D. Easton, Pa. 1897.

1894.—JACOBS, CHARLES, M.D. Professor of the Faculty of Medicine of Brussels; Secretary-General of the Permanent Committee of the Periodic International Congress of Gynecology and Obstetrics; Honorary President of the Belgian Society of Gynecology and Obstetrics; Honorary Fellow of the Gynecological Societies of New York and Chicago; Member of the Southern Surgical and Gynecological Association; Corresponding Member of the Gynecological Society of Paris; Surgeon to the Brussels Polyclinic. 53 Boulevard de Waterloo, Brussels, Belgium.

1889.—*KEITH, THOMAS, M.D. London, England. 1896.

1889.—LEOPOLD, G., M.D. Professor in the Royal Clinic for Diseases of Women. 90 Pfotenhauer-Strasse, Dresden, Germany.

1894.—*MACLEAN, DONALD, M.D. Detroit, Mich., 1903.

1890.—MARTIN, AUGUST, M.D. Professor of Gynecology in the University of Greifswald. Greifswald, Germany.

1895.—*MASTIN, CLAUDIUS HENRY, M.D., LL.D. Mobile, Ala. 1898.

1897.—MATHEWS, JOSEPH MCDOWELL, M.D. Professor of Diseases of the Rectum and Clinical Surgery, Hospital College of Medicine; President of the Kentucky State Board of Health; First Vice-President American Medical Association, 1898; President, 1899. 923 Fourth Avenue, Louisville, Kentucky.

1891.—*MOSES, GRATZ ASHE, M.D. St. Louis, Mo. 1901.

1889.—NICOLAYSEN, JULIUS, M.D. Professor of Surgery in the University of Norway. Christiania, Norway.

1891.—PIETRANERA, E., M.D. Professor of Obstetrics in the Medical Department of the National University; Director of the Maternity Branch of the Clinical Hospital. 2711 Calle Rio Adaria, Buenos Ayres, Argentine Republic, S. A.

1889.—*SAENGER, MAX, M.D. Prague. 1903.

1890.—SAVAGE, THOMAS, M.D., F.R.C.S. Eng. Surgeon to the Birmingham Hospital for Women. 33 Newhall Street, Birmingham, England.

1889.—SCHULTZE, BERNHARD SIGMUND, M.D. Professor of Gynecology; Director of the Lying-in Institute and of the Gynecological Clinic. 2 Sellierstrasse, Jena, Germany.

1896.—SÉGOND, PAUL, M.D. Professor of the Faculty of Medicine, Paris; Surgeon to the Salpêtrière; Principal Physician to the Orleans Railroad. 11 Quai d'Orsay, Paris, France.

1899.—SINCLAIR, WILLIAM JAPP, M.A., M.D. (Aberd.), M.R.C.P. Professor of Obstetrics and Gynecology, Owens College, Victoria University; Physician to the Manchester Southern Hospital for Diseases of Women and Children. 250 Oxford Road, Manchester, England.

1894.—*SLAVIANSKY, KRONID, M.D. St. Petersburg, Russia. 1898.

1888.—*SMITH, J. GREIG, M.A., C.M., M.B., F.R.S.E. Bristol, England. 1897.

1896.—STERNBERG, GEORGE MILLER, A.M., M.D., LL.D. Surgeon-General U. S. Army (Retired). 2144 Columbia Avenue, Washington, D. C.

1899.—*STORRS, MELANCTHON, A.M., M.D. (Founder. Transferred from Ordinary Fellow.) Hartford, Conn. 1900.

1888.—*TAIT, LAWSON, M.D., LL.D., F.R.C.S.E. Birmingham, England. 1899.

1900.—*THORNTON, J. KNOWSLEY, M.B., M.C. Cambridge, England. 1904.

1888.—WILLIAMS, SIR JOHN, BART., M.D., F.R.C.P. Plâs Llanstephan, Carmarthenshire, Wales.

1901.—WEBER, GUSTAV C. E., M.D., LL.D. Willoughby, Ohio.

1889.—VON WINCKEL, F., M.D. Professor of Gynecology and Director of the Royal Hospital for Women; Member of the Supreme Council and of the Faculty of Medicine in the University of Munich. 16A Sonnenstrasse, Munich, Germany.

Total, twenty-two Honorary Fellows.

CORRESPONDING FELLOWS.

1899.—BEUTTNER, OSCAR, M.D. Private-docent of the Faculty of Medicine. 2 Place de la Fasterie, Geneva, Switzerland.

1903.—CROZEL, G., M.D. Professor Libre of Gynecology. Rue Reuve No. 4, Lyons, France.

1903.—ELLIS, GUILHERME, M.D. Chief Surgeon to the Real Sociedade de Beneficencia Portuguese Hospital. 6 Rua Aurora, S. Paulo, Brazil, S.A.

1891.—GRIFFIN, HERBERT SPOHN, B.A., M.D. Surgeon to Hamilton City Hospital; Examiner in Obstetrics, University of Toronto. 157 Main Street, Hamilton, Ontario, Canada.

1903.—LANE, HORACE MANLEY, M.D., LL.D. President of Mackenzie College, S. Paulo, Brazil. 184 Rua da Consolacao, S. Paulo, Brazil, S. A.

1891.—MACHELL, HENRY THOMAS, M.D., L.R.C.P. Ed. Lecturer on Obstetrics, Women's Medical College; Surgeon to St. John's Hospital for Women; Physician to Victoria Hospital for Sick Children and to Hillcrest Convalescent Home. 95 Bellevue Avenue, Toronto, Ontario, Canada.

1898.—WRIGHT, ADAM HENRY, B.A., M.D. Univ. Toronto, M.R.C.S. Eng. Professor of Obstetrics in the University of Toronto; Obstetrician and Gynecologist to the Toronto General Hospital and Burnside Lying-in Hospital. *President,* 1891. (Transferred from Ordinary List, 1898.) 30 Gerrard Street, East, Toronto, Ont., Canada.

Total, seven Corresponding Fellows.

ORDINARY FELLOWS.

*Deceased. †Resigned.

1902.—ABRAMS, EDWARD THOMAS, A.M., M.D. Consulting Surgeon to the Lake Superior General Hospital; Member of the Michigan State Medical Society; Member of the American Medical Association. Dollar Bay, Mich.

1890.—ASDALE, WILLIAM JAMES, M.D. Professor of Diseases of Women, Western Pennsylvania Medical College (Medical Department, University of Western Pennsylvania). 5523 Ellsworth Avenue, Pittsburg, Pa.

1895.—BACON, JOSEPH BARNES, M.D. Professor of Rectal Diseases at the Post-Graduate Medical School; Instructor in Clinical Surgery in the Medical Department of Northwestern University. Macomb, Ill.

1903.—BANDLER, SAMUEL WYLLIS, M.D. Instructor in Gynecology in the New York Post-Graduate Medical School and Hospital; Adjunct Gynecologist to the Beth Israel Hospital. 229 West Ninety-seventh Street, New York, N. Y.

Founder.—BAKER, WASHINGTON HOPKINS, M.D. Senior Obstetrician to the Maternity Hospital, Physician to the German Hospital. 1610 Summer Street, Philadelphia, Pa. (Died April 1, 1904.)

1895.—BALDWIN, JAMES FAIRCHILD, A.M., M.D. Surgeon to Grant Hospital, 125 South Grant Avenue. Residence 405 E. Town Street, Columbus, Ohio.

1889.—BARROW, DAVID, M.D. Member of the Southern Surgical and Gynecological Association. Residence 379 South Broadway; Office 148 Market Street, Lexington, Ky.

1892.—BLUME, FREDERICK, M.D. Gynecologist to the Allegheny General Hospital and Pittsburg Free Dispensary; Obstetrician to the Roselia Maternity Hospital; Consulting Gynecolo-

gist to the Mercy Hospital; President of the Pittsburg Obstetrical Society, 1892. 524 Penn Avenue, Pittsburg, Pa.

1900.—BONIFIELD, CHARLES LYBRAND, M.D. Professor of Clinical Gynecology in the Medical College of Ohio; President of the Cincinnati Academy of Medicine, 1900; Gynecologist to the Good Samaritan, Christ's, and to Speer's Memorial Hospitals; formerly President of the Cincinnati Obstetrical Society; Secretary of the Section on Obstetrics and Gynecology, American Medical Association, 1901-4. Residence 2142 Auburn Avenue; Office 432 West Fourth Street, Cincinnati, Ohio.

1896.—BOSHER, LEWIS C., M.D. Professor of the Principles of Surgery and Clinical Lecturer on Genitourinary Surgery, Medical College of Virginia; Visiting Surgeon to the Old Dominion Hospital. 717 East Franklin Street, Richmond, Va.

Founder.—BOYD, JAMES PETER, A.M., M.D. Professor of Obstetrics, Gynecology, and Diseases of Children in the Albany Medical College; Gynecologist to the Albany Hospital; Consulting Obstetric Surgeon to St. Peter's Hospital; Fellow of the British Gynecological Society. 152 Washington Avenue, Albany, N. Y.

1889.—BRANHAM, JOSEPH H., M.D. Demonstrator of Anatomy in the College of Physicians and Surgeons; Visiting Surgeon to Bayview Hospital. 2200 Eutaw Place, cor. Ninth Avenue, Baltimore, Md.

1894.—BROWN, JOHN YOUNG, M.D. Late First Assistant Physician in the Central Kentucky Asylum for the Insane; President of the Mississippi Valley Medical Association, 1898; Superintendent and Surgeon in charge City Hospital. St. Louis, Mo.

1889.—*BURNS, BERNARD, M.D. Allegheny, Pa. 1892.

1898.—†CAMERON, MARKLEY CONNELL, M.D. Pittsburg. 1902.

Founder.—CARSTENS, J. HENRY, M.D. Professor of Obstetrics and Clinical Gynecology in the Detroit College of Medicine; Gynecologist to the Harper Hospital; Attending Physician to the Woman's Hospital; Obstetrician to the House of Providence; President of the Detroit Gynecological Society, 1892. *Vice-President*, 1888-89; *President*, 1895; *Executive Council*, 1896-98. 620 Woodward Avenue, Detroit, Mich.

1895.—CHASE, WALTER BENAJAH, M.D. Gynecologist to the Bushwick Hospital; Attending Surgeon and Gynecologist, Central Hospital and Dispensary; Consulting Gynecologist to the Long Island College Hospital; Councilor to the Long Island College Hospital; Fellow of the Brooklyn Gynecological Society (President, 1893); Member Medical Society County of Kings (President, 1892); Permanent Member Medical Society State of New York; Member of the Brooklyn Pathological Society, and Honorary Member of the Queens County Medical Society. *Executive Council,* 1899-1904. 263 Hancock Street, Borough of Brooklyn, New York.

Founder.—CLARKE, AUGUSTUS PECK, A.M., M.D. Dean and Professor of Gynecology and Abdominal Surgery in the College of Physicians and Surgeons, Boston; Vice-president of the American Medical Association, 1896; President of the Gynecological Society of Boston, 1891-92; Vice-president of the Pan-American Medical Congress, 1893, and of the Pan-American Medical Congress, Mexico, 1896; Honorary President of the Section of Obstetrics and Gynecology of the Twelfth International Medical Congress, Moscow, Russia, 1897; Member of the Massachusetts Medical Society; Fellow of the American Academy of Medicine; Member of the American Public Health Association. 825 Massachusetts Avenue, Cambridge, Mass.

1890.—*COLES, WALTER, M.D. St. Louis, Mo. 1892.

1892.—†CORDIER, ALBERT HAWES, M.D. Kansas City, Mo. 1900.

1901.—CRILE, GEORGE W., A.M., M.D. Professor of Clinical Surgery in the Western Reserve University Medical College; Surgeon to St. Alexis's Hospital; Associate Surgeon to Lakeside Hospital. 169 Kensington Street, Cleveland, O.

1894.—CROFFORD, THOMAS JEFFERSON, M.D. Professor of Physiology and Clinical Lecturer on Diseases of Women in the Memphis Hospital Medical College; Member of the Southern Surgical and Gynecological Association. *Vice-president,* 1900. 155 Third Street, Memphis, Tenn.

1897.—CUMSTON, CHARLES GREENE, B.M.S., M.D. (Geneva, Switzerland). Assistant Professor of Surgical Pathology, Tufts College Medical School, Boston; Member of the Massachusetts Medical Society; Honorary Member of the Surgical Society of

Belgium, and Corresponding Member of the Obstetrical and Gynecological Society of Paris; Corresponding Member of the Association of Genitourinary Surgeons of France; Corresponding Member of the Pathological Society of Brussels, Belgium; Corresponding Member of the Electro-therapeutical Society of France. *Vice-president*, 1902. 871 Beacon Street, Boston, Mass.

Founder.—†CUSHING, CLINTON, M.D. San Francisco, Cal. 1900.

1903.—DAVIS, JOHN D. S., M.D. Professor of Principles and Practice of Surgery and Clinical Surgery in the Birmingham Medical College; formerly Gynecologist to Birmingham Hospital of United Charities. Avenue G and Twenty-first Street, Birmingham, Ala.

1889.—*DAVIS, WILLIAM ELIAS B., M.D. Birmingham, Ala. 1903.

1902.—DEAVER, HARRY CLAY, M.D. Visiting Surgeon to the Episcopal, St. Christopher's, and St. Mary's Hospitals. 1534 North Fifteenth Street, Philadelphia, Pa.

1896.—DEAVER, JOHN BLAIR, M.D. Formerly Assistant Professor of Applied Anatomy at the University of Pennsylvania; Visiting Surgeon to the German Hospital. 1634 Walnut Street, Philadelphia, Pa.

1892.—DORSETT, WALTER BLACKBURN, M.D. Professor of Obstetrics and Gynecology in the Marion Sims-Beaumont College of Medicine, Medical Department of St. Louis University; Gynecologist to the Missouri Baptist Sanitarium, Evangelical Deaconess's Hospital and the Good Samaritan Hospital; Consulting Gynecologist to the St. Louis City and Female Hospitals. President of the St. Louis Medical Society, 1892; President of the Missouri State Medical Society, 1900. *Vice-president*, 1898; *President*, 1904. Residence, 5070 Washington Avenue; Office, Linmar Building, cor. Washington and Vandeventer Avenues, St. Louis, Mo.

1889.—DOUGLAS, RICHARD, M.D. Professor of Gynecology and Abdominal Surgery in the Vanderbilt Medical College; President of the Tri-State Medical Society of Alabama, Georgia, and Tennessee, 1893; Fellow of the British Gynecological Society; President of the Southern Surgical and Gynecological Associa-

tion, 1898. *Vice-president,* 1898. 110 South Spruce Street, Nashville, Tenn.

1901.—DUDLEY, CLIFTON ROGERS, M.D. Instructor in Obstetrics in the Beaumont Hospital Medical College. 903 North Taylor Avenue, St. Louis, Mo.

1892.—DUFF, JOHN MILTON, A.M., M.D., Ph.D. Chairman of the Section on Obstetrics and Diseases of Women in the American Medical Association, 1893; Professor of Obstetrics in the Western Pennsylvania Medical College; Gynecologist to the Western Pennsylvania Hospital; Consulting Surgeon and Gynecologist to the South Side Hospital; Fellow of the American Academy of Medicine; President of the Pittsburg Obstetrical Society, 1891. *Executive Council,* 1898-1900. Horne Office Building, 515 Penn Avenue, Pittsburg, Pa. (Died May 10, 1904.)

1895.—DUNN, B. SHERWOOD, M.D. Officier d'Académie; Corresponding Member of the Société Obstétrique et Gynécologique de Paris; Member of the Société Clinique des Praticiens de France, etc. 26 Broadway, New York.

1898.—DUNN, JAMES C., M.D. Obstetrician to Reineman Maternity Hospital. 524 Penn Avenue, Pittsburg, Pa.

1895.—†DUNN, JAMES HENRY, M.D. Minneapolis, Minn. 1899.

1892.—DUNNING, LEHMAN HERBERT, M.D. Professor of Diseases of Women in the Medical College of Indiana; Consulting Gynecologist to the Indianapolis City Hospital and Dispensary. *Executive Council,* 1899-1902, 1904; *Vice-president,* 1900; *President,* 1903. Willoughby Building, 224 North Meridian Street, Indianapolis, Ind.

1895.—EARLE, FRANK BRECKINRIDGE, M.D. Professor of Obstetrics at the College of Physicians and Surgeons. 903 West Monroe Street, Chicago, Ill.

1899.—EASTMAN, THOMAS BARKER, A.B., M.D. Professor of the Medical and Surgical Diseases of Women, Central College of Physicians and Surgeons; Gynecologist to the City Hospital, City Dispensary, and Central Free Dispensary.. 331 North Delaware Street, Indianapolis, Ind.

1895.—FERGUSON, ALEXANDER HUGH, M.D. Professor of Surgery at the Chicago Post-Graduate Medical School. Suite 300, Reliance Building, 100 State Street, Chicago, Ill.

1895.—FISH, EDMUND FROST, M.D. Professor of Gynecology in Milwaukee Medical College; Gynecologist to the Trinity and Milwaukee County Hospitals; Gynecologist to the Milwaukee Free Dispensary. 507-508 Wells Building, Milwaukee, Wis.

1903.—FRANK, LOUIS, M.D. Professor of Abdominal and Pelvic Surgery in the Medical Department of Kentucky University; Surgeon to Louisville City Hospital; Surgeon and Gynecologist to the Broadway Infirmary. 229 West Chestnut Street, Louisville, Ky.

1890.—FREDERICK, CARLTON CASSIUS, B.S., M.D. Clinical Professor of Gynecology in the Medical Department of Buffalo University; Obstetrician and Gynecologist to the Buffalo Woman's Hospital; Obstetrician to the Widows' and Infants' Asylum; Gynecologist to the Erie County Hospital. 64 Richmond Avenue, Buffalo, N. Y.

1891.—GIBBONS, HENRY, JR., A.M., M.D. Dean and Professor of Obstetrics and Diseases of Women and Children in Cooper Medical College; Consulting Physician to the French and the Children's Hospitals. 920 Polk Street, San Francisco, Cal.

1902.—GILLETTE, WILLIAM J., M.D. Professor of Abdominal Surgery and Gynecology in the Toledo Medical College; Surgeon to Robinwood Hospital. 1613 Jefferson Street, Toledo, O.

1895.—GILLIAM, DAVID TOD, M.D. Professor of Gynecology, Starling Medical College; Gynecologist to St. Anthony Hospital; Gynecologist to St. Francis Hospital; Consulting Gynecologist to State Street Dispensary; Member of the American Medical Association, Mississippi Valley Medical Association, and Ohio State Medical Society; Honorary Member of the Northwestern Medical Society; Member and Ex-president of Columbus Academy of Medicine. 50 North Fourth Street, Columbus, O.

1895.—GOLDSPOHN, ALBERT, M.D. Professor of Gynecology, Post-Graduate Medical School; Senior Gynecologist, German Hospital; Attending Gynecologist, Post-Graduate and Charity Hospitals. *Vice-president*, 1901. Residence, 519 Cleveland Avenue; Office, 34 Washington Street, Chicago, Ill.

1894.—†GRIFFITH, JEFFERSON DAVIS, M.D. Kansas City, Mo. 1904.

1903.—GUENTHER, EMIL ERNEST, M.D. Senior Assistant Gynecologist and Obstetrician to St. Barnabas's Hospital; Attending Surgeon to the German Hospital, Newark. 159 West Kinney Street, Newark, N. J.

1892.—*HAGGARD, WILLIAM DAVID, M.D. 1901.

1900.—HAGGARD, WILLIAM DAVID, JR., M.D. Professor of Gynecology, Medical Department University of Tennessee; Professor of Gynecology and Abdominal Surgery, University of the South (Sewanee); Gynecologist to the Nashville City Hospital; President of the Nashville Academy of Medicine; Secretary of the Section on Diseases of Women and Obstetrics, American Medical Association, 1898; Fellow (and Secretary) of the Southern Surgical and Gynecological Association; Member of the Alumni Association of the Woman's Hospital, N. Y. *Vice-president,* 1904. 302 Vine, corner Union Street, Nashville, Tenn.

1889.—HALL, RUFUS BARTLETT, A.M., M.D. Professor of Gynecology and Clinical Gynecology at the Miami Medical College; Gynecologist to the Presbyterian Hospital; Member of the British Gynecological Association; of the Southern Surgical and Gynecological Association; of the American Medical Association; of the Ohio State Medical Society (President, 1900); of the Cincinnati Academy of Medicine; President of the Cincinnati Obstetrical Society, 1896. *Vice-president,* 1891; *President,* 1900; *Executive Council,* 1904. Berkshire Building, 628 Elm Street, Cincinnati, O.

1903.—HAMILTON, ALBERT GRANT, M.D. Surgeon in Chief to the Springfield Hospital. Springfield, Neb.

1902.—HAMILTON, CHARLES SUMNER, A.B., M.D. Professor of the Principles of Surgery in Sterling Medical College; Surgeon to Mt. Carmel and Children's Hospitals. 1 North Fourth Street, Columbus, O.

1894.—HAYD, HERMAN EMIL, M.D., M.R.C.S. Eng. Gynecologist to the Erie County Hospital; Surgeon to the German Hospital. *Vice-president,* 1903. 493 Delaware Avenue, Buffalo, N. Y.

Founder.—*HILL, HAMPTON EUGENE, M.D. 1894.

1891.—HOLMES, JOSUS BILLINGTON SANDERS, M.D. Professor of Obstetrics in the Southern Medical College; President of the Georgia State Medical Association, 1890; Member of the Southern Surgical and Gynecological Association; Member of the American Medical Association. 17 West Cain Street, Atlanta, Ga.

1891.—HOWITT, HENRY, M.D., M.R.C.S. Eng. Surgeon to the Guelph General and St. Joseph's Hospital, Guelph; Member of the British and Ontario Medical Associations; Medical Health Officer for the City of Guelph. *Vice-president,* 1895. 235 Woolwich Street, Guelph, Ontario, Canada.

1895.—HUMISTON, WILLIAM HENRY, M.D. Associate Professor of Gynecology in the Medical Department of Western Reserve University; Gynecologist in Chief to St. Vincent's Charity Hospital; Consulting Gynecologist to the City Hospital; President of the Ohio State Medical Society, 1898. *Executive Council,* 1902-1903. 536 Rose Building, Cleveland, O.

1898.—HYDE, JOEL W., M.D. Obstetric Surgeon to St. Mary's Hospital; Consulting Obstetrician to the Long Island College Hospital; Consulting Gynecologist to Central Hospital. 215 Schermerhorn Street, Brooklyn, N. Y.

1892.—†HYPES, BENJAMIN MURRAY, A.M., M.D. St. Louis, Mo. 1900.

1901.—ILL, CHARLES L., M.D. Surgeon to German Hospital; Assistant Gynecologist to St. Michael's and St. Barnabas's Hospitals; Obstetrician to St. Barnabas's Hospital, Newark; Assistant Gynecologist to All Souls' Hospital, Morristown. 188 Clinton Avenue, Newark, N. J.

Founder.—ILL, EDWARD JOSEPH, M.D. Surgeon to the Woman's Hospital; Medical Director of St. Michael's Hospital; Gynecologist and Supervising Obstetrician to St. Barnabas's Hospital; Consulting Gynecologist to the German Hospital and the Bnoth Israel Hospital of Newark, N. J., to All Souls' Hospital, Morristown, N. J., and to the Mountain Side Hospital, Montclair, N. J.; Member of the Southern Surgical and Gynecological Association. Vice-president from New Jersey of the Pan-American Medical Congress of 1893. *Vice-president,* 1893; *President,*

1899; *Executive Council,* 1901-1903. 1002 Broad Street, Newark, N. J.

1897.—INGRAHAM, HENRY DOWNER, M.D. Clinical Professor of Gynecology and Pediatrics, Medical Department of the University of Buffalo; Consulting Gynecologist to the Buffalo Woman's Hospital and to the Erie County Hospital; Consulting Gynecologist to Providence Hospital. 405 Franklin Street, Buffalo, N. Y. (Died May 23, 1904.)

Founder.—*JARVIS, GEORGE CYPRIAN, M.D. Hartford, Conn. 1900.

1894.—JAYNE, WALTER ADDISON, M.D. Professor of Gynecology in the Medical Department of the University of Denver; Consultant in Gynecology, St. Luke's Hospital; Gynecologist to the Arapahoe County Hospital, Denver. 416 McPhee Building, Denver, Col.

1892.—*JELKS, JAMES THOMAS, M.D. Hot Springs, Ark. 1902.

1894.—†JENNINGS, CHARLES GODWIN, M.D. Detroit, Mich. 1901.

1891.—JOHNSTON, GEORGE BEN, M.D. Professor of Gynecology and Abdominal Surgery in the Medical College of Virginia; Surgeon to the Old Dominion Hospital; Physician to St. Joseph's Female Orphan Asylum; Consulting Surgeon to the City Free Dispensary; Member of the American Surgical Association; Vice-president of the Southern Surgical and Gynecological Association 1892, President 1897; Ex-president of the Richmond Medical and Surgical Society; President of the Virginia State Medical Society, 1897. *Vice-president,* 1897. 407 East Grace Street, Richmond, Va.

1902.—KEEFE, JOHN WILLIAM, M.D. Attending Surgeon to the Gynecological Department of St. Joseph's Hospital; Attending Surgeon to the Rhode Island Hospital; Consulting Surgeon to the Providence Lying-in Hospital. 259 Benefit Street, Providence, R. I.

1893.—LAIDLEY, LEONIDAS HAMLIN, M.D. Professor of Gynecology in the Beaumont Hospital Medical College; Surgeon in

chief to the Protestant Hospital; Medical Director of the St. Louis World's Fair of 1904. 3538 Washington Avenue, St. Louis, Mo.

1898.—LANGFITT, WILLIAM STERLING, M.D. Surgeon in chief to St. John's Hospital. 510-512 Bijou Building, Penn Avenue, Pittsburg, Pa.

1901.—LINCOLN, WALTER RODMAN, B.A., M.D. Lecturer on Gynecology, College of Physicians and Surgeons of Cleveland, O. Lennox Building, corner Erie Street and Euclid Avenue, Cleveland, O.

1900.—LINVILLE, MONTGOMERY, A.B., M.D. Surgeon to Slemango Valley Hospital; Surgeon to three lines of Pennsylvania railways. 35 North Mercer Street, New Castle, Pa.

1890.—LONGYEAR, HOWARD WILLIAMS, M.D. Gynecologist to Harper Hospital; Physician to the Woman's Hospital; President of the Detroit Gynecological Society, 1889; Chairman of the Section on Obstetrics and Gynecology of the Michigan State Medical Society, 1892. *Vice-president,* 1893. 271 Woodward Avenue, Detroit, Mich.

Founder.—*LOTHROP, THOMAS, M.D. Buffalo, N. Y. 1902.

1896.—LYONS, JOHN ALEXANDER, M.D. Instructor in Gynecology at the Post-Graduate Medical School; Gynecologist and Lecturer to Nurses at the Chicago Hospital. 4118 State Street, Chicago, Ill.

1891.—MACDONALD, WILLIS GOSS, M.D. Professor of Abdominal and Clinical Surgery in Albany Medical College; President of the Medical Society of the State of New York, 1900. 27 Eagle Street, Albany, N. Y.

1901.—McCANDLESS, WILLIAM A., A.M., M.D. Chief Surgeon St. Mary's Infirmary; Visiting Surgeon to the City Hospital; Professor of Special and Clinical Surgery, Marion Sims-Beaumont College of Medicine. 3857 Westminster Place, St. Louis, Mo.

1891.—*McCANN, JAMES, M.D. Pittsburg, Pa. 1893.

1898—*McCANN, THOMAS, M.D. Pittsburg, Pa. 1903.

1894.—†McGUIRE, EDWARD, M.D. Richmond, Va. 1900.

Founder.—McMURTRY, LEWIS SAMUEL, A.M., M.D. Professor of Gynecology in the Hospital College of Medicine; Gynecologist to Sts. Mary and Elizabeth Hospital; Fellow of the Edinburgh Obstetrical Society: Fellow of the British Gynecological Society; Corresponding Member of the Obstetrical Society of Philadelphia and of the Gynecological Society of Boston; Member (President, 1891) of the Southern Surgical and Gynecological Association. *Executive Council,* 1891-1892, 1895-1904; *President,* 1893. 1912 Sixth Street, Louisville, Ky.

Founder.—MANTON, WALTER PORTER, M.D. Professor of Clinical Gynecology and Adjunct Professor of Obstetrics, Detroit College of Medicine; Gynecologist to Harper Hospital and the Eastern Michigan Asylum for the Insane; Vice-president of Medical Board of the Woman's Hospital and Foundlings' Home; Consulting Gynecologist to the Northern Michigan Asylum and St. Joseph's Retreat; Gynecic Surgeon to the House of the Good Shepherd; President of the Detroit Academy of Medicine, 1892-1894; President of the Detroit Gynecological Society, 1890; Fellow of the British Gynecological Society; Fellow of the Royal Microscopical Society and of the Zoölogical Society of London. *Vice-President,* 1894. 32 Adams Avenue, W., Detroit, Mich.

Founder.—†MAXWELL, THOMAS JEFFERSON, M.D. Keokuk, Iowa. 1902.

1893.—*MICHAEL, JACOB EDWIN, A.M., M.D. Baltimore, Md. 1895.

Founder.—MILLER, AARON BENJAMIN, M.D. Professor of Gynecology in the Medical Department of Syracuse University; Gynecologist to St. Joseph's Hospital, House of the Good Shepherd and Dispensary. *Vice-president,* 1899; 1904. 326 Montgomery Street, Syracuse, N. Y.

1896.—*MOONEY, FLETCHER D., M.D. St. Louis, Mo. 1897.

1890.—MORRIS, ROBERT TUTTLE, A.M., M.D. Professor of Surgery in the New York Post-Graduate Medical School and Hospital. *Vice-president,* 1892. 616 Madison Avenue, New York, N. Y.

Founder.—*MOSES, GRATZ ASHE, M.D. St. Louis, Mo. 1901. (See Honorary Fellows.)

1894.—MURPHY, JOHN BENJAMIN, A.M., M.D. Professor of Surgery in the College of Physicians and Surgeons and in the Post-Graduate Medical College; Attending Surgeon to the Cook County Hospital and to Alexander Hospital. Residence, 3152 Michigan Avenue; Office, 400 Reliance Building, 100 State Street, Chicago, Ill.

Founder.—MYERS, WILLIAM HERSCHEL, M.D. Professor of Clinical and Abdominal Surgery, Fort Wayne College of Medicine; Surgeon to St. Joseph's Hospital; Member of the American and the British Medical Associations; Member of the Pathological Society of London; Member of the International Congress of Gynecologists and Obstetricians; Member of the Chicago Medical Society. *Vice-president,* 1890. 523 West Wayne Street, Fort Wayne, Ind.

1897.—NICHOLS, WILLIAM R., M.D. Winnipeg, Canada.

1896.—NOBLE, GEORGE HENRY, M.D. Gynecologist to the Grady Hospital; Secretary of the Section on Obstetrics and Gynecology of American Medical Association, 1897; Member of the Southern Surgical and Gynecological Association. 131 and 133 South Pryor Street, Atlanta, Ga.

1903.—NOBLE, THOMAS BENJAMIN, M.D. Professor of Abdominal Surgery in the Central College of Physicians and Surgeons; Consultant in the Diseases of Women at the City Hospital, City Dispensary, and Protestant Deaconess's Hospital, Indianapolis. 427 Newton Claypool Building, Indianapolis, Ind.

1889.—PAINE, JOHN FANNIN YOUNG, M.D. Professor of Obstetrics and Gynecology in the School of Medicine, University of Texas; Obstetrician and Gynecologist to the John Sealy Hospital; President of the Texas State Medical Association, 1888; Vice-president of the Section on Public and International Hygiene in the Ninth International Medical Congress; Member of the American Medical Association and of the Southern Surgical and Gynecological Association. S. E. corner Broadway and Twenty-sixth Street, Galveston, Texas.

1899.—PANTZER, HUGO OTTO, M.D. Gynecologist to the City Hospital and City Dispensary; Consulting Gynecologist to the

Deaconess's Hospital and to the Indiana State Hospital. 508 No. New Jersey Street, Indianapolis, Ind.

1890.—PEARSON, WILLIAM LIBBY, M.D. 713 Union Street, Schenectady, N. Y.

1891.—PECK, GEORGE SHERMAN, M.D. Consulting Surgeon to the Youngstown City Hospital. *Vice-president,* 1896. 26 West Federal Street, Youngstown, O.

1899.—PFAFF, ORANGE G., M.D. Adjunct Professor of Obstetrics and Diseases of Women in the Medical College of Indiana; Gynecologist to the City, Deaconess's, and St. Vincent's Hospitals. 1337 North Pennsylvania Street, Indianapolis, Ind.

1898.—PORTER, MILES F., M.D. Ex-president Indiana State Medical Society. *Vice-president,* 1902. 207 West Wayne Street, Fort Wayne, Ind.

Founder.—POTTER, WILLIAM WARREN, M.D. Consulting Gynecologist to the Woman's Hospital; Consulting Surgeon to the Buffalo General Hospital; President and Examiner in Obstetrics, New York State Medical Examining and Licensing Board; Chairman of Section of Obstetrics and Diseases of Women, American Medical Association, 1890; President of the Buffalo Obstetrical Society, 1884-1886; Member of the Southern Surgical and Gynecological Association; President of the Medical Society of the State of New York, 1891; Executive President of the Section of Gynecology and Abdominal Surgery, First Pan-American Medical Congress (1893). *Secretary,* 1888-1904. 284 Franklin Street, Buffalo, N. Y.

1903.—POUCHER, JOHN WILSON, M.D. Consulting Surgeon to Vassar Brothers Hospital, Poughkeepsie. 339 Mill Street, Poughkeepsie, N. Y.

1891.—*PRAEGER, E. ARNOLD, M.D. Los Angeles, Cal. 1898.

Founder.—PRICE, JOSEPH, M.D. Physician in charge of the Obstetrical and Gynecological Department of the Philadelphia Dispensary; Member of the Southern Surgical and Gynecological Association; Honorary Fellow of the Medical Society of the State of New York; Honorary Fellow of the South Carolina Medical Society; Honorary Fellow of the Virginia Medical Society; Member of the British Gynecological Association and of the Edinburgh Obstetrical Society. *Executive Council,* 1894-

1895; *President,* 1896. 241 North Eighteenth Street, Philadelphia, Pa.

Founder.—REED, CHARLES ALFRED LEE, A.M., M.D. Professor of Gynecology and Abdominal Surgery in the Cincinnati College of Medicine and Surgery and in the Woman's Medical College of Cincinnati; Surgeon to the Cincinnati Free Surgical Hospital for Women; Secretary-General of the First Pan-American Medical Congress, 1893; Member of the Southern Surgical and Gynecological Association; Fellow of the British Gynecological Society; President of the American Medical Association, 1901. *Executive Council,* 1890-1897; *President,* 1898. Rooms 61 and 62, The Groton, N. E. corner Seventh and Race Streets, Cincinnati, O.

1896.—*RHETT, ROBERT BARNWELL, JR., M.D. Charleston, S. C. 1901.

1890.—RICKETTS, EDWIN, M.D. Professor of Abdominal Surgery and Gynecology at the Cincinnati Polyclinic; Member of the American and British Medical Associations; Member of the Southern Surgical and Gynecological Association. *Vice-president,* 1899; *Executive Council,* 1901, 1904; *President,* 1902. 408 Broadway, Cincinnati, O.

1889.—*ROHÉ, GEORGE HENRY, M.D. Baltimore, Md. 1899.

1892.—ROSENWASSER, MARCUS, M.D. Dean and Professor of Diseases of Women and Abdominal Surgery in the University of Wooster; Gynecologist to the Cleveland Hospital for Women and Children; Consulting Gynecologist to the City Hospital; Member of the American Medical and Ohio State Medical Associations. *Vice-president,* 1903. 722 Woodland Avenue, Cleveland, Ohio.

1890.—ROSS, JAMES FREDERICK WILLIAM, M.D., L.R.C.P. Eng. Gynecologist to the Toronto General Hospital; Surgeon to the Woman's Hospital; Lecturer in Clinical Gynecology at the University of Toronto. *Executive Council,* 1892-1896; *President,* 1897. 481 Sherbourne Street, Toronto, Ont., Canada.

1902.—RUNYAN, JOSEPH PHINEAS, M.D. Division Surgeon to the Choctaw, Oklahoma and Gulf Railroad; Secretary of the Arkansas State Medical Association, President, 1904. 1514 Schiller Avenue, Little Rock, Ark.

1903.—SADLIER, JAMES EDGAR, M.D. Consulting Surgeon to Highland Hospital, Poughkeepsie. 295 Mill Street, Poughkeepsie, N. Y.

1901.—SCOTT, N. STONE, A.M., M.D. Professor of Surgery, College of Physicians and Surgeons, Cleveland; Consulting Surgeon to City Hospital; Consulting Surgeon to St. John's Hospital; Surgeon to the Out-patient Department of Cleveland General Hospital. 531 Prospect Avenue, Cleveland, O.

1895.—SELLMAN, WILLIAM ALFRED BELT, M.D. Professor of the Diseases of Women and Children at the Baltimore University School of Medicine; Member of the Medical and Chirurgical Faculty of Maryland; also of the Baltimore Medical and Surgical Association; the Gynecological and Obstetrical Association of Baltimore; the Clinical Society; the Baltimore Journal Club; the American Medical Association, etc. 5 East Biddle Street, Baltimore, Md.

1890.—SEXTON, JOHN CHASE, A.M., M.D. *Executive Council,* 1894; *Vice-president,* 1897. Rushville, Ind.

1889.—SEYMOUR, WILLIAM WOTKYNS, A.B., M.D. Surgeon to the Samaritan Hospital, Troy, N. Y.; formerly House Surgeon of the Boston City Hospital; Member of the American Medical Association; Fellow of the New York State Medical Association; Member of the British Medical Association. *Executive Council,* 1892-1893. 105 Third Street, Troy, N. Y.

1902.—SIMONS, MANNING, M.D. Professor of Clinical Surgery in the Medical College of the State of South Carolina; Surgeon to St. Francis Xavier's Infirmary and to the City Hospital. 22 Rutledge Avenue, Charleston, S. C.

1899.—SIMPSON, FRANK FARROW, A.B., M.D. Assistant Gynecologist to Mercy Hospital. Bessemer Building, Pittsburg, Pa.

1901.—SKEEL, ROLAND EDWARD, M.D. Professor of Obstetrics in Cleveland College of Physicians and Surgeons; Consulting Obstetrician to the City Hospital; Obstetrician to the Cleveland General Hospital. 785 Prospect Street, Cleveland, O.

1891.—SMITH, CHARLES NORTH, M.D. Professor of Obstetrics and Clinical Gynecology in the Toledo Medical College; Gynecologist to St. Vincent's Hospital. 234 Michigan Street, Toledo, Ohio.

1901.—STAMM, MARTIN, M.D. Professor of Operative and Clinical Surgery in the College of Physicians and Surgeons, Cleveland. 316 Napoleon Street, Fremont, O.

1902.—STARK, SIGMAR, M.D. Professor of Obstetrics and Clinical Gynecology in the Cincinnati College of Medicine and Surgery; Gynecologist to the Jewish Hospital. 1108 East McMillan Street, Cincinnati, O.

Founder.—*STORRS, MELANCTHON, A.M., M.D. Hartford, Conn. (See Honorary List, 1899.) 1900.

1899.—SWOPE, LORENZO W., M.D. Surgeon to the Consolidated Traction Company; Assistant Surgeon to the West Pennsylvania Hospital. 3609 Forbes Street, Pittsburg, Pa.

1894.—†TAPPEY, ERNEST TAYLOR, A.M., M.D. Detroit, Mich. 1899.

1901.—TATE, MAGNUS ALFRED, M.D. Professor of Diseases of Children and Embryology at the Cincinnati College of Medicine and Surgery. 361 East Third Street, Cincinnati, O.

1894.—†TAYLOR, HUGH MCGUIRE, M.D. Richmond, Va. 1901.

Founder.—†TAYLOR, WILLIAM HENRY, M.D., Ph.D. Cincinnati, O. 1898.

1890.—THOMAS, GEORGE GILLETT, M.D. Ex-president Medical Society of the State of North Carolina. Wilmington, N. C.

1898.—†THOMAS, JOSEPH DIO, M.D. Pittsburg, Pa. 1900.

1895.—THOMPSON, FRANK DANIEL, M.D. Professor of Gynecology in the Medical Department of Fort Worth University. 412 Adams Street, Fort Worth, Texas.

1895.—TOMPKINS, CHRISTOPHER, M.D., Ph.D. Professor of Obstetrics and Dean of the Medical College of Virginia; Obstetrician to the Old Dominion Hospital; Member of the Southern Surgical and Gynecological Association. 116 East Franklin Street, Richmond, Va.

Founder.—*TOWNSEND, FRANKLIN, A.M., M.D. Albany, N. Y. 1895.

Founder.—VANDER VEER, ALBERT, A.M., M.D., Ph.D. Professor of Didactic, Clinical, and Abdominal Surgery in the Al-

bany Medical College; Attending Surgeon to the Albany Hospital; Consulting Surgeon to St. Peter's Hospital; Fellow of the American Surgical Association; Fellow of the British Gynecological Society; Member of the Southern Surgical and Gynecological Association; Corresponding Member of the Boston Gynecological Society. *Executive Council,* 1889-1891, 1895-1904; *President,* 1892. 28 Eagle Street, Albany, N. Y.

1891.—WALKER, EDWIN, M.D., Ph.D. Gynecologist to the Evansville City Hospital; President of the Indiana State Medical Society, 1892; Member of the American Medical Association and of the Mississippi Valley Medical Association; Member of the Southern Surgical and Gynecological Association. *Vice-president,* 1901. 712 Upper Fourth Street, Evansville, Ind.

1889.—WENNING, WILLIAM HENRY, A.M., M.D. Clinical Professor of Gynecology at the Miami Medical College; Chief of Staff and Gynecologist to St. Mary's Hospital. 722 Laurel Street, Cincinnati, O.

Founder.—WERDER, XAVIER OSWALD, M.D. Professor of Gynecology at the Western Pennsylvania Medical College (Medical Department, University of Western Pennsylvania); Consulting Gynecologist at the Allegheny General Hospital; Gynecologist to the Mercy Hospital and Pittsburg Free Dispensary; Obstetrician to the Roselia Maternity Hospital; Consulting Gynecologist to St. Francis's Hospital; Consulting Surgeon to the South Side Hospital. *Treasurer,* 1888-1904. 524 Penn Avenue, Pittsburg, Pa.

1896.—WESTMORELAND, WILLIS FOREMAN, M.D. Professor of Surgery at the Atlanta Medical College. Equitable Building, Atlanta, Ga.

1895.—†WHEATON, CHARLES AUGUSTUS, M.D. St. Paul, Minn. 1903.

1897.—WHITBECK, JOHN W., M.D. Gynecologist to the Rochester City Hospital; Commissioner of the Board of Health. 322 East Avenue, Rochester, N. Y.

1897.—WILLIAMS, HENRY T., M.D. Attending Surgeon, City Hospital; Attending Surgeon, St. Mary's Hospital; Attending Surgeon, Monroe County Penitentiary; Consulting Surgeon to

the Home for the Friendless. 274 Alexander Street, Rochester, N. Y.

1902.—WILLIAMS, JOSEPH JOHN GURNEY, M.D. Gynecologist to the Philadelphia Dispensary; Consultant in the Obstetrical Department of the Philadelphia Dispensary. 331 South Thirteenth Street, Philadelphia, Pa.

1900.—ZINKE, ERNST GUSTAV, M.D. Professor of Obstetrics and Clinical Midwifery in the Medical College of Ohio, University of Cincinnati; Obstetrician and Gynecologist to the German Hospital; Obstetrician to the Maternity Hospital. 13 Garfield Place, Cincinnati, O.

Total, one hundred and eight Ordinary Fellows.

MINUTES OF THE PROCEEDINGS

AT THE

SIXTEENTH ANNUAL MEETING

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS AND GYNECOLOGISTS,

HELD IN THE

HALL OF THE NORTHWESTERN UNIVERSITY,

Chicago, Ill.,

SEPTEMBER 22, 23, AND 24, 1903.

SIXTEENTH ANNUAL MEETING.

CHICAGO, ILL., SEPTEMBER 22, 23 AND 24, 1904.

The following-named Fellows were present:

ABRAMS, EDWARD T.	DOLLAR BAY.
BALDWIN, JAMES F.	COLUMBUS.
BONIFIELD, CHARLES L.	CINCINNATI.
BLUME, FREDERICK	PITTSBURG.
BROWN, JOHN YOUNG	ST. LOUIS.
CARSTENS, J. HENRY	DETROIT.
DORSETT, WALTER B.	ST. LOUIS.
DUNNING, LEHMAN H.	INDIANAPOLIS.
FERGUSON, ALEX. HUGH	CHICAGO.
FRANK, LOUIS	LOUISVILLE.
GILLETTE, WILLIAM J.	TOLEDO.
GILLIAM, D. TOD	COLUMBUS.
GOLDSPOHN, ALBERT	CHICAGO.
GUENTHER, EMIL E.	NEWARK.
HAGGARD, WILLIAM D.	NASHVILLE.
HALL, RUFUS B.	CINCINNATI.
HAYD, HERMAN E.	BUFFALO.
HOWITT, HENRY	GUELPH.
ILL, CHARLES L.	NEWARK.
ILL, EDWARD J.	NEWARK.
LONGYEAR, HOWARD W.	DETROIT.
LYONS, JOHN A.	CHICAGO.
McMURTRY, LEWIS S.	LOUISVILLE.
MACDONALD, WILLIS G.	ALBANY.
MILLER, AARON B.	SYRACUSE.
MORRIS, ROBERT T.	NEW YORK.
MURPHY, JOHN B.	CHICAGO.
NOBLE, THOMAS B.	INDIANAPOLIS.
PANTZER, HUGO O.	INDIANAPOLIS.
PFAFF, ORANGE G.	INDIANAPOLIS.

PORTER, MILES F.	FORT WAYNE.
POTTER, WILLIAM W.	BUFFALO.
PRICE, JOSEPH	PHILADELPHIA.
RICKETTS, EDWIN	CINCINNATI.
SCOTT, N. STONE	CLEVELAND.
SEXTON, JOHN C.	RUSHVILLE.
SIMPSON, FRANK F.	PITTSBURG.
STAMM, MARTIN	FREMONT.
WERDER, XAVIER O.	PITTSBURG.
ZINKE, E. GUSTAV	CINCINNATI.

Letters or messages of regret were received from the following-named Fellows:

Honorary.—A. Cordes, Geneva; Sir J. Halliday Croom, Edinburgh; J. McFadden Gaston, Atlanta; G. Leopold, Dresden; Joseph McDowell Mathews, Louisville; Bernard Schultze, Jena; William Japp Sinclair, Manchester; Surgeon-General George M. Sternberg, U. S. Army (retired); J. Knowsley Thornton, Cambridge; and Sir John Williams, Plâs Llanstephan, Wales.

Corresponding.—Oscar Beuttner, Geneva; Herbert S. Griffin, Hamilton; Adam H. Wright, Toronto.

Ordinary.—David Barrow, Joseph H. Branham, George W. Crile, Thomas J. Crofford, H. C. Deaver, John B. Deaver, Richard Douglas, John M. Duff, Henry Gibbons, Jr., William H. Humiston, Joel W. Hyde, George Ben Johnston, Montgomery Linville, Walter P. Manton, George S. Peck, Charles A. L. Reed, M. Rosenwasser, James F. W. Ross, William Wotkyns Seymour, Sigmar Stark, Frank D. Thompson, Albert Vander Veer, Edwin Walker, William H. Wenning, and J. J. Gurney Williams.

The Executive Council recommended that the following-named physicians be invited to attend the sessions as members by invitation:

Frank T. Andrews,	Chicago.
E. W. Andrews,	"
C. S. Bacon,	"
C. W. Barrett,	"
Arthur Dean Bevan,	"
Anna M. Braunwarth,	"
Norman Bridge,	"
Henry T. Byford,	"
Alfred C. Croftan,	"

William Cuthbertson,	Chicago.
J. B. DeLee,	"
Mary E. Donoghue,	"
E. C. Dudley,	"
Daniel R. Eisendrath,	"
Richard M. Fletcher, Jr.,	"
Lemuel C. Grosvenor,	"
Fernand Henrotin,	"
R. W. Holmes,	"
Allen B. Kanavel,	"
H. C. Kerber,	"
Carl H. von Klein,	"
Charles J. Kurtz,	"
G. Frank Lydston,	"
P. L. Macdonald,	"
Louisa Martin,	"
Henry P. Newman,	"
Edward H. Ochsner,	"
David O'Shea,	"
S. E. Pillock,	"
Silas T. Richman,	"
H. T. Ricketts,	"
Byron Robinson,	"
Eliza H. Root,	"
J. G. Ross,	"
H. Schiller,	"
David L. Schram,	"
George H. Simmons,	"
William G. Willard,	"
Lucy Waite,	"
A. R. Adams,	Macomb, Ill.
J. E. Allaben,	Rockford, Ill.
L. G. Bowers,	Richmond, Ind.
S. D. Culbertson,	Piper City, Ill.
F. B. Dorsey,	Keokuk, Ia.
R. B. Dugdale,	South Bend, Ind.
W. A. Duringer,	Fort Worth, Tex.
Robert O. Earl,	St. Paul.
O. H. Elbrecht,	St. Louis.
George L. Eyster,	Rock Island, Ill.
Charles Graefe,	Sandusky, O.
Hannah M. Graham,	Indianapolis.

George Goodfellow,	San Francisco.
J. E. Gilcreest,	Gainesville, Tex.
William G. Gromed,	Superior, Wis.
W. E. Guthrie,	Bloomington, Ill.
D. W. Harrington,	Milwaukee.
Lewis J. Hinchman,	Detroit.
G. W. King,	Helena, Mont.
F. C. Larimore,	Mount Vernon, O.
R. A. McClelland,	Yorkville, Ill.
Edward J. McOscar,	Fort Wayne.
C. H. Mayo,	Rochester, Minn.
M. V. Meddaugh,	Detroit.
C. Jeff. Miller,	New Orleans.
K. Murchison,	Griswold, Ia.
Beatrice Pearce,	Waukegan.
Charles R. Scott,	Belvedere, Ill.
John D. Singley,	Pittsburg.
Charles Stoltz,	South Bend, Ind.
H. D. Wall,	Angola, Ind.
F. A. Waggoner,	Hamilton, Ill.
D. A. Webb,	Scranton, Pa.
H. E. Welsh,	Hutchinson, Kan.
L. J. Willien,	Terre Haute.

FIRST DAY.—*Tuesday, September 22, 1903.*

Morning Session.—The Association was called to order by the President, Dr. L. H. Dunning, of Indianapolis, at 10 A.M.

President Dunning introduced Dr. William A. Evans, of Chicago, who delivered the following

ADDRESS OF WELCOME.

MR. PRESIDENT AND FELLOWS OF THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS: On behalf of the Chicago profession it is not my wish merely to welcome you to Chicago, because I believe you understand already that you are welcome to this city. Perhaps, however, I can very well occupy the few moments I shall engage your attention with explaining in some way why it is that you are more than welcome, and why

you should feel more than at home in this great city. Perhaps there is no place in this country, and that means on the face of the earth, where questions are fought out with more candor, more frankness, with fewer limitations, than in the city in which you have appointed your sixteenth annual meeting, which you have assembled to hold. We here absorb peoples from every country, and we in this community give to those peoples the largest opportunity to work out their salvation, untrammeled by law perhaps, untrammeled by custom, untrammeled by any circumventing or limiting conditions. There is no city on the face of the earth where there is so much freedom of discussion and freedom of action as in the city of Chicago. Perhaps the day will come when all the problems of sociology will work themselves out spontaneously and along natural lines, unhampered by force of restriction, as the problems of science and problems of nature are being worked out, and in the coming of that time the city of Chicago and its people are certainly pioneers.

We are confronted at times with problems for which there seems to be no solution. Perhaps we are in somewhat the same position as Judge Dickinson, who was talking on the negro question to Mr. Roosevelt while on a pleasure trip a few months ago. Said the President to Judge Dickinson: "Judge, what do you think of the negro question? What is the right way to solve it?" The Judge replied: "Mr. President, if you will permit me, I will tell you a story which seems applicable to your question. In Mississippi, in Monroe County, there is a creek called Suquatonchee. On the creek lived a man by the name of Ben Halliday. On one occasion a man said to him, 'What is the right way to spell Suquatonchee'?" Mr. Halliday replied that "Some folks spell it one way and others spell it another way, but according to my way of thinking, there ain't no right way to spell it." (Laughter.) That is true, as most of you have concluded by this time, as to the negro question, and it would seem quite as true regarding many other questions that confront the American people.

There are many questions which confront the citizens of Chicago. Perhaps you have wondered what this has to do with the word of welcome to your body. It has this to do with it: I have heard on more than one occasion, and from more than one man who has listened to your discussions, that there is no association in which discussions are freer and franker and more honest than in this body. There are no men who go straight to the root of things as they see them more directly, or as directly as the mem-

bers of this body, regardless of the personalities that invest these questions, or regardless of the personal equations of the men who are here to discuss them. The men who participate in your discussions are regardful only for the truth as they see it, with the lights they have before them. A body composed of such men as this, with a President such as occupies this chair, with traditions such as these, I now welcome to this fairest of all communities, where no question is asked as to antecedents, as to family relations, as to any question save, Can you be useful? You, then, are welcome without a word of welcome, because in discussing any procedure, in discussing any scientific fact, you ask not a question as to the traditions or the antecedents; you ask not a question as to the personality of the men who argue these questions, but you simply ask, "Is it right?" Therefore, I take particular pleasure in welcoming you to this city of Chicago. The pleasure is mine because I know that in this city you will feel at home for the simple but great reason that we are of one blood. (Applause.)

RESPONSE BY THE PRESIDENT.

DR. EVANS: On behalf of the Fellows of the American Association of Obstetricians and Gynecologists we most heartily accept your cordial welcome to the city of Chicago. We know this welcome is heartfelt and genuine. We have experienced the warm hospitality of your city in days gone by. We were inspired by the presence of many of your great men and by the energy of your city. We are impressed with the greatness of your city, with its citizens, its institutions, and in a measure with your great State. We all look with pride to the city of Chicago because of its rapid growth and the immense energy we have seen developed here; because of the greatness of its great men, and because they have been leaders among us; and further, because of the spirit which prevails in all of their discussions, and which has been alluded to by you this morning. Therefore, we accept with heartiest thanks your very cordial welcome. (Applause.)

REPORT OF COMMITTEE OF ARRANGEMENTS.

Dr. John B. Murphy, Chairman of the Local Committee of Arrangements, made a brief report, stating that on the evening of the second day a banquet would be held in the green room of the Auditorium Hotel. Also, that the local members would give a

luncheon at the Chicago Athletic Club, Thursday afternoon at 1 o'clock, to which all of the members and guests were invited. He said the session of Thursday afternoon would be held at the Mercy Hospital instead of at the University Buildings.

Papers were then read as follows:

1. "The Relationship of the Colon to Abdominal Tumors," by Dr. James F. Baldwin, Columbus.

Discussed by Drs. Carstens, Dunning, and the discussion closed by the essayist.

2. "The Value of Vaginal Cesarean Section, with Report of a Case," by Dr. Martin Stamm, Fremont.

3. "The Limitations of Cesarean Section," by Dr. E. Gustav Zinke, Cincinnati.

These papers were discussed jointly, the discussion being opened by Dr. Charles S. Bacon, Chicago (by invitation), and continued by Drs. Dorsett, Ricketts, Blume, Carstens, Hall, Bonifield, Hayd, Porter, Baldwin, and closed by the essayists.

4. "The Gilliam Operation: A Clinical Contribution," by Dr. Edward J. Ill, Newark, N. J.

Discussed by Drs. Hayd, Goldspohn, Gilliam and Ill.

On motion, the Association then took a recess until 2:30 P.M.

Afternoon Session, 2:30 o'clock.

5. "Analysis of Common Causes of Death Following Pelvic and Abdominal Operations," by Dr. Joseph Price, Philadelphia.

Discussed by Drs. Hayd, Goldspohn, Morris, Baldwin, Bonifield, Brown, Ricketts, Carstens, Longyear, Hall, and the discussion closed by the essayist.

6. "Report of a Fourth Consecutive Successful Operation for Acute Perforated Gastric Ulcer, with General Infection of the Peritoneal Cavity," by Dr. Henry Howitt, of Guelph, Ontario.

Discussed by Drs. C. H. Mayo, Rochester, Minn. (by invitation), Murphy, and the discussion closed by the essayist.

7. "Should the Uterus and Ovaries be Removed in Operating for Double Pyosalpinx?" by Dr. C. C. Frederick, Buffalo.

Discussed by Drs. Morris, Hall, Dorsett, Porter, Haggard, Goldspohn, Dudley (E. C.) by invitation, Carstens, Blume, Murphy, Bonifield, and the discussion closed by Dr. Frederick.

On motion, the Association took a recess until 9:30 A.M., Wednesday.

SECOND DAY.—*Wednesday, September 23, 1903.*

Morning Session, 9:30 o'clock.—The President in the chair.

8. "The Indications and Technique of Vaginal Drainage for Suppuration in the Pelvis," by Dr. Albert Goldspohn, Chicago.

Discussed by Drs. Ill, Gilliam, Longyear, Carstens, Murphy, and the discussion closed by the essayist.

9. "Shortening the Round Ligaments by the Blunt Hook Method," by Dr. H. W. Longyear, Detroit.

Discussed by Drs. Ill, Goldspohn, Gilliam, McMurtry, and the discussion closed by the essayist.

At this juncture pathologic specimens with brief histories were presented by Drs. X. O. Werder, C. C. Frederick, and James F. Baldwin.

10. "Study of the Symptoms and Surgical Treatment of Intestinal Perforation in Typhoid Fever," by Dr. W. D. Haggard, Nashville.

Discussed by Drs. Murphy, Morris, Macdonald, Mayo (C.H.), and the discussion closed by Dr. Haggard.

11. "Memorial Address on the Life and Character of Dr. William E. B. Davis," by Dr. Lewis S. McMurtry, Louisville.

At the conclusion of the address by Dr. McMurtry, the second Vice-president, Dr. Herman E. Hayd, of Buffalo, took the chair, and the President delivered his address, selecting for his subject, "Some of the Disappointments of the Surgeon."

On motion, the Association took a recess until 2:30 P.M.

Afternoon Session, 2:30 o'clock.

The President in the chair.

12. "The Rational Treatment of Post-partum Infections of the Uterus," by Dr. D. Tod Gilliam, Columbus.

Discussed by Drs. Longyear, Allaben, Noble, and the discussion closed by the essayist.

13. "Penetrating Gunshot and Stab Wounds of the Abdomen, with Report of Cases," by Dr. John Young Brown, St. Louis.

Discussed by Drs. Macdonald, Ricketts, Murphy, Stamm, and the discussion closed by the essayist.

14. "Infantile Uterus, Scanty Menstruation, Amenorrhea and Dysmenorrhea Cured by Stem Pessaries," by Dr. J. Henry Carstens, Detroit.

Discussed by Drs. Henrotin, Longyear, Gilliam, and, in closing, by the essayist.

15. "Tuberculosis of the Female Genitalia and Peritoneum," by Dr. John B. Murphy, Chicago.

On motion of Dr. Longyear, the discussion on Dr. Murphy's paper was postponed until Thursday morning.

On motion, the Association adjourned until Thursday morning, at 10 o'clock.

THIRD DAY.—*Thursday, September 24, 1903.*

Morning Session, 10 o'clock.—The President in the chair.

16. "Movable Kidney, with Secondary Cyst Formation Resembling Ovarian Cyst," by Rufus B. Hall, Cincinnati.

Discussed by Drs. Hayd, Dunning, Baldwin, Guenther, Frederick, MacDonald, and, in closing, by the essayist.

17. "Surgery of the Ileocecal Valve in Nonmalignant Disease," by Dr. N. Stone Scott, Cleveland.

Here the President stated that owing to the number of papers to be read but little time could be allotted for their discussion.

Dr. McMurtry thereupon moved that papers be discussed up to the last minute. Carried.

18. "The Choice of Methods in Closing the Abdominal Incision," by Dr. Edwin Ricketts, Cincinnati.

Discussed by Drs. Morris, Dunning, Longyear, Baldwin, McMurtry, Dorsett, and, in closing, by the essayist.

19. "Supravaginal Amputation in Fibroid Tumors, with Report of Cases," by Dr. Herman E. Hayd, Buffalo.

Discussed by Drs. Gilliam, Longyear, McMurtry, Baldwin, and the discussion closed by the essayist.

20. "Ovarian Grafting," by Dr. Robert T. Morris, New York.

Discussed by Drs. Gilliam, Murphy, Hayd, Goldspohn, Baldwin, and the discussion closed by the essayist.

21. "The Pelvic Musculature in Disease," by Dr. Hugo O. Pantzer, Indianapolis.

22. "The Use of Veratrum Viride in Surgical and Obstetrical Practice," by Dr. Chas. L. Bonifield, Cincinnati.

On motion, the Association took a recess until 2:30 P.M.

Afternoon Session, 2.30 o'clock.

This session was held at the Mercy Hospital.

23. "Operations in Imperative Surgery in Private Houses; a Demonstration of Surgical Technic," by Dr. Willis G. Macdonald, Albany.

24. "Coincidental Tubal and Extrauterine Pregnancy, with a Report of a Case," by Dr. F. F. Simpson, Pittsburg.

After the reading of Dr. Simpson's paper, Dr. John B. Murphy presented three patients upon whom he had operated for kidney trouble. He narrated the history of each case, and outlined the operations that were performed.

It was hoped that there would be sufficient time to discuss the paper of Dr. Murphy on "Tuberculosis of the Female Genitalia and Peritoneum," but there was not, hence the subject was passed.

The following papers were read by title, and ordered published in the TRANSACTIONS.

1. "Ectopic Pregnancy," by Dr. Henry D. Ingraham, Buffalo.

2. "The Technic of Gynecological Operations and Treatment," by Albert Vander Veer, Albany.

3. "Intravaginal Elongation of the Cervix," by Dr. Marcus Rosenwasser, Cleveland.

4. "Conservative Surgical Treatment of the Uterine Adnexa," by Dr. Augustus P. Clarke, Cambridge.

5. "Hysterectomy in Infectious Diseases of the Uterine Appendages," by Dr. Harry C. Deaver, Philadelphia.

6. "Palliative Treatment of Cancer of the Cervix," by Dr. Walter B. Chase, Brooklyn.

7. "Abdominal versus Vaginal Hysterectomy in Carcinoma where the Radical Operation is Warranted," by Dr. John B. Deaver, Philadelphia.

8. "Anesthesia in Abdominal Surgery," by Dr. J. J. Gurney Williams, Philadelphia.

Dr. Dunning, the retiring President, in introducing his successor, said:

GENTLEMEN: This closes the scientific program. I desire to thank you for the many courtesies you have extended to me, as well as for the intense interest you have shown during the sessions; also for the kind spirit that has pervaded the meeting.

It affords me very great pleasure to introduce to you the newly-elected President, Dr. Dorsett, of St. Louis, who will preside over the deliberations of the Association for the next year. (Applause.)

Dr. Dorsett, in accepting the Presidency, made a few appropriate remarks.

On motion, the Association then adjourned.

WILLIAM WARREN POTTER,
Secretary.

EXECUTIVE SESSIONS.

Tuesday, September 22, 1903.

The President, Dr. L. H. Dunning, in the chair.

On behalf of the Executive Council, the Secretary presented a list of candidates for Fellowship, and the Association then elected by ballot the following-named candidates:

Samuel Wyllis Bandler, New York; John D. S. Davis, Birmingham; Louis Frank, Louisville; Emil E. Guenther, Newark; Albert G. Hamilton, Springfield; Thomas B. Noble, Indianapolis; John W. Poucher, Poughkeepsie; James E. Sadlier, Poughkeepsie.

The Secretary, on behalf of the Executive Council, submitted a list of names of members of the medical profession of Chicago, and of other cities, who were nominated by the Committee of Arrangements and invited to participate in the proceedings as members by invitation.

The Secretary said that he had received messages and letters of regret from absent Fellows, and, on motion, the reading of these letters and telegrams was dispensed with.

The Secretary submitted the accounts of the Secretary and Treasurer, and stated that they were ready to be audited.

The President appointed as an Auditing Committee Drs. J. C. Sexton and Charles L. Ill.

The Secretary stated that the Council at its meeting last night authorized the nomination for Corresponding Fellow of Dr. G. Crozel, of Lyons, France, who, on motion, was elected a Corresponding Fellow.

Adjourned.

Wednesday, September 23, 1903.

The Executive Session was called to order by the President at 5:30 P.M.

The Secretary reported an amendment to the Constitution offered by Dr. Carstens last year, which reads:

Resolved, That 125 be stricken out and other figures be inserted.

On motion of Dr. John A. Lyons, Chicago, the figures 150 were inserted in place of 125, and the amendment was then adopted.

The Secretary stated that the Auditing Committee had exam-

ined the accounts of the Secretary and Treasurer and had found the same correct, with a balance of $35.68 in the treasury.

On motion, the report was adopted.

The next order of business was the election of officers, which resulted as follows:

President, Dr. Walter B. Dorsett, St. Louis; *First Vice-president,* Dr. A. B. Miller, Syracuse; *Second Vice-president,* Dr. W. D. Haggard, Nashville; *Secretary,* Dr. Wm. Warren Potter (re-elected), Buffalo; *Treasurer,* Dr. X. O. Werder (reëlected), Pittsburg.

To fill the two vacancies in the Executive Council, Drs. Dunning and Hall were nominated, and the Secretary, in accordance with instructions, cast the ballot of the Association for their election.

The time and place of meeting were left to be decided by the Executive Council, which subsequently named St. Louis, September 13, 14, 15, and 16, 1904.

Dr. McMurtry offered the following:

Resolved, That the cordial thanks of this Association be and are hereby tendered to our Fellows residing in Chicago for their efficient services in the arrangements for this annual meeting; for their constant attendance upon all the sessions, and for the courtesy and hospitality they have so generously extended all the Fellows of the Association.

There being no further business, the Executive session then adjourned.

WILLIAM WARREN POTTER,
Secretary.

PAPERS

READ AT THE

SIXTEENTH ANNUAL MEETING

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OF

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Chicago, Ill.,

SEPTEMBER 22, 23, AND 24, 1903.

THE PRESIDENT'S ADDRESS.

SOME OF THE SOURCES OF THE DISAPPOINTMENTS OF THE SURGEON.

By L. H. DUNNING, M.D.,
INDIANAPOLIS.

It is fitting that I should at this time, with many expressions of obligation to you, acknowledge my appreciation of the high honor you have conferred upon me in choosing me to act as your President during the present year. Conscious of the high obligations resting upon me as your Chairman, it has been my chief endeavor, during the last year to labor effectively for the best interests of the Association. That you have cooperated with me in this endeavor is fully attested by the splendid programme we have been able to present at this meeting. Your interest in the high purpose of this Association is again verified. I am more than satisfied with the efforts that you as individual members, and as a united Association, have made to advance the cause of scientific medicine and surgery. As I have known and studied the history of the Association, it has been one of growing influence and power. It has always stood and is standing to-day for the best in obstetrics, gynecology, abdominal and pelvic surgery. Its members are representative men from all sections of the continent. Not a few of its Fellows are recognized as authority in all lands in which modern ideas of medicine and surgery prevail. In works through its individual members and as an organized body it has been a force in the country. The newest and the best products of the medical and surgical world have been presented at our meetings, and not a few of the newest and best ideas have originated with our Fellows. Such, in brief, are some of the characteristics of the Association which it is your pleasure and mine to be affiliated with. To me it is a great pleasure and

a pride to be a member of the American Association of Obstetricians and Gynecologists.

A feeling of sadness and bereavement came into my heart as I was penning the above lines. It was that our beloved deceased Fellow, Dr. Davis, would never meet with us again. What a strong member was he, and how efficient, well-balanced and kind. I have seldom known a man of kinder heart or one whose judgment I was more willing to trust than his.

It was fitting that our distinguished Fellow, his intimate friend, Dr. McMurtry, should tell us of his life and works. He has expressed to us in noble and appropriate language true ideas of the strength of character and wealth of attainments of our departed member.

I have chosen as the subject of the main portion of my address, "Some of the Sources of the Disappointments of the Surgeon." It is not my purpose to present to you an address filled with pessimistic statements, gloomy forebodings, or records of unhappy failures. There is no more pitiable object than that of an elderly physician or surgeon, who, after having passed a quarter or half century in successful endeavor in the practice of his calling, falls in the declining years of his life into pessimism or disbelief. To lose hope in one's successful endeavor and faith in the beneficence of one's lifework is heart breaking. I once knew a surgeon of this sort, who, during a splendid career as teacher and practitioner, reached an exalted position, and who, after his powers began to decline, became a sceptic as regards the curative value of medicine and surgery. A few years later found him specializing in the use of a secret remedy, the constituents of which he did not know, and later still he had entirely lost the confidence of his former patrons and become a cynical old man, largely dependent upon the support of an accomplished daughter, whom he had educated in his prosperous days. From such a fate, and from other unhappy states that must surely come to a surgical doubter or scoffer, may we all be delivered. I beg of my listeners not to hear a pessimistic note in this simple address. Such is not the spirit that has prompted its composition. The motive that has actuated the writer has been one of inquiry to the end that the causes of our disappointments may be ascertained, so that in the future they may be avoided.

It is pleasant to think upon and to enumerate the glorious achievements of successful surgeons. It is a theme to call forth the eloquence of men. Not soon will those who were present for-

get the memorable occasion when a number of his friends gathered in the parlors of the Grünwald House, New Orleans, to present to the beloved Garcelon their token of love and esteem. Not far had his friends proceeded in the course, when Dr. Garcelon, moved by a recollection of the grand achievements of the past and by the anticipation of more magnificent and beneficent doings in the future, began to speak, at first deliberately, then more and more earnestly and eloquently, and his theme was the triumphs of the surgeons whom he had known. The theme enthused him; again the fire of early manhood was in his veins. Men were forgotten. In dilating upon the triumphs of surgery, there was not a word touching upon a personal motive of preferment or aggrandizement. All related to the accomplishments of the practice of the art of saving life and assuaging suffering. Such was the influence upon his hearers, and so in unison were they with his utterances, that they for a time forgot in the greater theme, their beloved friend, whom they had gathered to honor. No greater pleasure could come to me, if I were able to do it, than to give expression in an adequate manner, to my satisfaction and pride in the great and lasting benefits that have come to mankind through the application of the science and the practice of the art of surgery.

I believe in surgery and practice it, because I have faith in its beneficent power and have experienced some of the joy that comes with a moderately successful endeavor, so the tone of my address shall be hopeful. It cannot be denied, however, that we, as surgeons, meet with our full share of disappointments. The failure of the expectations of the surgeon is a grievous disappointment. Judging from reports in medical journals, we are led to believe that there are not a few of these disappointments in the paralysis following the bloodless operation for cure of congenital dislocation of the femur. The successful extraction of a cataract from the eye has given promise of restoration of the sight to the organ operated upon, yet when a sufficient time has elapsed it is found that the patient must walk in total darkness the remainder of his days. A woman is racked by pain in the ovaries, which organs are prolapsed and inflamed. They are extirpated under the belief that such procedure will bring to the patient not only relief from suffering, but also restoration of health, so that she may again with joy take up and discharge the duties of life. Alas! this is not infrequently a delusive hope.

Former successes lead the surgeon to promise himself and his

patient restoration to health or relief from fear of recurrence of the ovarian cyst, if it be extirpated. Upon opening the abdomen, a papillomatous cyst, with secondary peritoneal involvement, is found, and the surgeon knows that his hope must fall. After months of thorough study and experimentation, a surgeon brings forward a new procedure, the execution of which he believes will prove a means of lessening the mortality of some grave operation, or will diminish the risks of recurrence of some malignant lesion. The technique seems scientific and its execution is accomplished with ease. The profession accepts it. Its popularity grows so that in a few short months reports of cases are published in many countries and languages. After a time, when a great number of histories of cases have accumulated, it is found that less good has been accomplished by this means than by former long used ones.

These are a few examples which I think make plain the idea entertained by the writer in the discussion of his topic. Some of us are so constituted that a few failures are sufficient to make us sceptical of the value of all surgery. Indeed, I have heard surgeons say that they believe surgery had done more harm than good to mankind. Such men shut their eyes to the great accomplishments of our conservative and healing art. A few pitiful disappointments are not to be reckoned in comparison with the uniform benefits which the life-saving procedures daily executed by dextrous surgeons are producing. They should not cause the devotee of the surgical art to falter or turn back. They should rather stimulate him to more careful study of etiology, pathology and diagnosis, and more painstaking care in the selection of procedures and in the after-treatment of patients.

In our eagerness to accomplish our desires, we ofttimes set too rapid a pace, forgetting that, "To climb steep hills requires slow pace at first." When we see a surgeon running with hot haste in pursuit of a newly announced idea, whether of principle or technique, we know full well it will be a chance if he does run wide of the mark he has set before him.

In consequence of the great activity of the last quarter of a century, in presenting new ideas in surgery, both of etiology, indications and methods, it has required the utmost diligence on our part to keep abreast with all of them. Because of the impossibility of proving all things presented, we have been compelled to accept the dictum of many men whom we consider authority, and have been, sometimes, alas, led astray, and disappointment

has overtaken us. Is it not time for us to pause and consider, to weigh, estimate and to accept only upon demonstration, an alleged truth, whether of principle or practice? Certainly in the end, truth will prevail and shall we not save ourselves and our patients many humiliating and heart breaking failures, if we are but more deliberate?

This has been called the golden age of surgery. Let the surgeon of to-day be careful lest it be called the age of surgical daring. Ruskin has shown us that in art, "Repose, the type of God's permanency," is the test of greatness. A few men there were in the past generation who possessed to a marked degree the elements of repose. Of these Pasteur, Lister, Tait and Sims are conspicuous. Their work shall abide. There are those among the surgeons of to-day who have wrought equally well, yet whose names it is better for the historian of future generations to write.

The character of an age is given by its great men, only when the rank and file are in accord with the teachings and practice of the masters The great activity in surgery of the last quarter of a century has promised much, but has been somewhat disappointing, because of the meagerness of established principles produced. In our own specialty note the changes of opinion and practice that are constantly taking place in regard to methods of procedure in intestinal surgery, methods of treatment of malpositions of the uterus, and respecting the etiology and treatment of cancer.

I would not lift my voice against the struggle of competent men to establish the truth. My cry is rather against those who are continually presenting something new, something crude, and something which in the end is liable to prove delusive.

All surgeons should remember, that there are ever present underlying principles which must be known and duly considered if their efforts are to be successful. Some of these principles, operative in our physical being and influencing our health, are tissue metabolism, growth, maturity and decay; the necessity of the presence and the normal performance of the functions of all the organs of the body. Organs and structures, unless supernumerary, are created or evolved for a purpose and this purpose is in some manner connected with our continued existence and perfect health. Organs and tissues of our body are corelated. Organs and tissues, though crippled and imperfectly performing their functions, are ofttimes helpful in maintaining a proper equilibrium. The organism exists in accordance with established laws, among

which, aside from those noted above, is one, an inherent power which, for want of a better name, we call vital force, some manifestations of which are seen in the growth of organs and development of functions, in the power of resistance to deleterious influences, and in the power to build up, and to recuperate and to tolerate baneful materials. These are some few of the underlying principles governing our existence, and are well known to all surgeons; but sometimes a surgeon seems to suffer from a temporary lapse of memory, so that in consequence of the impelling force of his earnest desire to restore his patient he proceeds to amputate, extirpate or exsect, when rest and passive motion, drainage and pure air, would ofttimes bring about a restoration of health to the patient. Such a surgeon will be doomed to many disappointments.

I do not feel the slightest inclination to attribute to surgeons, as a class, an overweening desire for preferment as to positions of honor or recognition of eminent ability. As a class they are votaries of an earnest desire, that of the welfare of their patients and the upbuilding of the science and art of surgery. In the endeavor to realize this desire, in the accomplishment of this end, there is no labor too great for the true surgeon and no sacrifice too self-sacrificing. For toil without recompense, forgetfulness of self, patient endurance of dangerous situations and circumstances, and patient waiting for the opportune moment in the face of the ingratitude of the patient and friend, I have not elsewhere seen so striking a figure as the physician and surgeon.

I would not apotheosize the surgeon, for he is very human, yet is his an exalted motive. His power for good can scarcely be measured by human calculation, but he is human, with all the frailties of mortal clay. He hates to be told this by his critics and enemies, but he says it to himself a thousand times, and again and again reforms his plans. To the end of his professional life he struggles to strengthen his weak points, and often seemingly with little avail. Still he is undaunted and always hopeful.

In surgery some one must take the initiative. We must have explorers in medicine and surgery. Sometimes such an one becomes a discoverer. After him comes the pioneer and later those who permanently occupy the ground. If it be found productive under the patient toil of the latter, that which is of greatest value is possessed and permanently improved. The work of discovery, of pioneering and of permanent development and cultivation of

a new country, is not more arduous or productive of results than is a corresponding work in medicine and surgery.

A Jenner discovers a fact and applies it. A century later a Pasteur works out the principle underlying the fact and extends its application. Then follow the tireless workers who have given the world its ideas of asepsis, antisepsis, and the many serums, the latter to render the human family immune from certain dangerous contagious diseases and to cure others. Numerous currents and counter-currents of opinion have prevailed respecting the influence of the application of the principles thus promulgated, yet there has been a steady onward progress. There have been a few deaths because of the hasty acceptance and application of alleged discovered facts, but as a whole there has been a steady advancement in the use of these life-saving means and measures. Here we have the discoverer, the explorer, the pioneer and the cultivator of the soil.

This seems to be the natural order. Many parallel instances might be cited in special fields of surgery. The discoverer never says the last word respecting any subject. Tait did not do it in writing upon ectopic pregnancy and gallstone surgery. Neither did Sims in his teachings relating to the etiology and technique of the operative cure of vesico-vaginal fistula. They were great discoverers in these lines, greater than any that have followed, yet we are plodding along cultivating the soil, as it were, and making other, though minor, discoveries.

Ours is an arduous labor, very honorable, and should be satisfying. Too often it is not so considered, so that too frequently we see men breaking away from the well-established facts and though not thoroughly prepared by nature or attainments, endeavoring to become discoverers. Such men are certainly doomed to disappointment. This is a most interesting theme for thought and study. One of the eminent teachers and authors in the department of chemistry recently said at a meeting of representative physicians and surgeons, that our medical papers would not be ideal until there were excluded from them all old established facts, and the writers or preferably the speakers should present in a concise statement only the new facts they had themselves worked out and demonstrated. This is the utterance of an idealist. His are extreme views which, if acted upon, would deprive many of the profession of a knowledge of some of the most important discoveries made by our original investigators. Tyndall labored a year and a half verifying the discoveries of Pasteur. The recollec-

tion of the powerful influence in establishing correct ideas of pelvic surgery of the pioneer work of Tait's students in this country is too recent and too familiar to require more than a mention. These men did true pioneer work. By writing, speaking and demonstrating persistently in season and out of season they finally brought the surgeons of this country to the right way of thinking and doing. Numerous other examples press themselves upon us demonstrating the value of proving all things and of promulgating all truth. It is a perilous thing to the patients for some surgeon to attempt the role of original investigators, especially if the living human subject be the only one upon whom the would-be discoverer can apply his alleged new principle or method. An opportunity such as came to Sims is seen by but few men in a thousand years. Only Sims saw it. "He saw what he brought eyes to see." He had few peers in this country in his generation. He had a right, such as few men who have ever lived, possessed, of working out his ideas upon the living human subject. With him the results justified the means.

The patient is an unknown factor in every surgical case. Until we have found the means of determining his power of resistance and his recuperative powers, the means of determining the number and nature of the micro-organisms in his sweat glands, the presence of the fatty heart, and atheroma of the coronary artery, we need not be surprised if we occasionally meet with unexpected failures. The temperament and habit of the patient frequently do not reveal themselves, until too late to enable us to eliminate their deleterious influences. Latent and dormant lesions of other organs and tissues than those under surgical treatment are sometimes suddenly aroused to great activity and lead to unlooked for results. Every surgeon of experience can readily recall instances verifying these statements.

The emergency cases are most frequently disappointing—those in which an acute illness of a surgical nature calls for prompt surgical intervention, as in perforation of the typhoid ulcer, appendicitis, or obstruction of the bowels; also cases in which the patients have sustained grave injuries which call for serious rescue operations. Here, of course, time is not permitted for investigation into the history of the present condition of the organs of the patient. The surgeon must act at once and accept the results. The surgeon, however, cannot justify himself by any excuses if, in cases not requiring haste, he does not use every measure known to him to obtain a good working knowledge of

the patient's history as to former illnesses, and the present state of the organs of the body. Do the best he is able, something will not infrequently escape the surgeon's observations and lead him to disappointment, but not overwhelming disappointment, for the difficulties he encounters, the obstacles obtruded in the way of successful endeavor lend great variety and interest to his work. Clear sailing and continued sunshine bring ennui. A succession of typical cases brings one into routine practice which is fatal to the highest endeavor and attainment of the practitioner. The weak surgeon is the one who shrinks from difficult tasks and large undertakings. The strong one is he who finds the greatest satisfaction in successfully accomplishing the most difficult undertaking. I am aware that this is all very commonplace, yet it is fitting to our subject. We are continually meeting members of our profession who are drifting as aimlessly as the derelicts upon the wide ocean, all because of their lack of capacity or unwillingness to endure the hardships and disappointments of difficult and complicated work. Such men seldom experience the satisfaction, joy and exultation successful endeavor brings.

The last source of disappointment I shall mention relates to the surgeon and his environments. I have already recorded my high estimate of the ability, earnest purposes, and the conscientiousness of the surgeon. Possessing all these qualities he nevertheless finds himself at times deliberately acted upon by external circumstances, and by conditions of the mind and body which he can not at the moment control. The most nearly perfect surgeon is one who orders his life with the utmost care. Nature must have been profuse in her gifts to him; a good constitution, excellent health, superior intellectual and temperamental endowments, an indomitable will, inflexible purposes, and high moral susceptibilities. His training should be for the development of these faculties together with the special training that will give him the requisite knowledge and skill to do high grade special work. Now add to this good judgment, self-control and moderation in all things, and we have the essential elements of a successful surgeon. The elements must be combined in the right proportion and be of excellent quality in order to yield anything like a perfect product. Even when the combinations are good, and the results excellent some unfortunate circumstances may arise to temporarily unfit the surgeon for the performance of his most successful work. Some of these are, temporary ill-health, over-anxiety, over-indulgence in eating and drinking, loss of sleep,

overwork, too great haste, lapse of memory, a preoccupied mind or the presence of uncongenial or antagonistic assistants. Any or all of these factors, acting upon the man in the presence of important work, may bring unfavorable results. I need only to suggest these to bring to your minds at once methods of relief. He who would attain to the highest in medicine and surgery must order his life with the utmost care and moderation. Ruskin would write over the door of every school of art the word, "Moderation." The artist does not need to be taught the necessity of exercising this virtue in order to realize the highest ideals of his art, more than does the surgeon. A strenuous life in the vigor of early manhood along the line of one's aptitudes and powers is to be commended, but great and fitful energy erratically applied, especially if it be for the accomplishment of an unworthy or non-essential object, will almost certainly bring the man to disaster with his lifework incomplete.

Disappointments in greater or lesser degree will come to all surgeons be they ever so successful, for it seems to be the natural order of things that contrasting or antagonistic elements exist side by side. The man who becomes despondent and inactive because of this, is the weak man. The strong man will endeavor to magnify the good and crush out the evil. He will in so far as it is possible remove the ugly and retain the beautiful. The surgeon's hope should be to eliminate every preventable source of failure, and when failures do come to make of them taskmasters compelling the way to better things.

RELATIONSHIP OF THE COLON TO ABDOMINAL TUMORS.

By JAMES F. BALDWIN, M.D.,
COLUMBUS.

When a physician is consulted by a patient presenting an abdominal tumor, the first thought that comes to his mind is as to the origin of the growth. This having been determined, if possible, the question of treatment comes second. With the patient, the treatment is of course first, the etiology being of very minor importance. Many times the diagnosis can be arrived at promptly, since the history of the case and the location and feel of the growth will enable a decision to be reached by the direct method. More frequently, however, it is necessary to reach a diagnosis by the method of exclusion. It was the prominence given to this method of diagnosis which made the late Prof. J. M. Da Costa so famous as a clinician. The relation of the new growth to adjacent organs, what may be called its "geography," is sometimes of very great importance in establishing the diagnosis, and it is here that an exact knowledge of anatomy is of very great value.

At a meeting of this Association a year or two ago, a very prominent surgeon reported a case of cystic tumor of the spleen, in which he had operated with an idea that the tumor was an ordinary ovarian cyst, and did not discover his mistake until the incision had been made. In reporting the case, he remarked incidentally that a differential diagnosis between a cystic tumor of the spleen of large size and an ovarian tumor was not possible. With that statement the writer, during the discussion which followed, took issue; taking the ground that the relationship of the descending colon to a splenic tumor was entirely different from its relationship to an ovarian tumor. It is this relationship of the colon, which is a comparatively fixed organ in the abdomen, which I wish to present more particularly in this paper. Harris,

of Chicago, drew special attention to this over five years ago, but his paper seemed to attract little attention. Ziemssen, in 1883, suggested the dilatation of the colon to aid in the differential diagnosis of colonic disease. Writers in general, however,

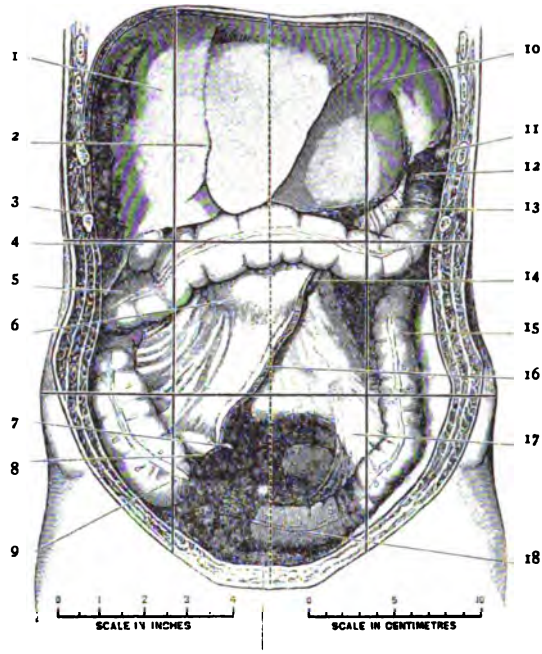

Fig. 1. Showing the relations of the colon after the removal of the jejunum and the ileum. (From a photograph.) The transverse colon is more regular and both the liver and cecum are lower than usual. (Cunningham.)

1. Liver. 2. Attachment of falciform ligament. 3. 10th rib. 4. Gall bladder. 5. Hepatic flexure. 6. Third part of duodenum. 7. Apex of vermiform appendix. 8. Terminal part of ileum. 9. Cecum. 10. Stomach. 11. Spleen. 12. Splenic flexure. 13. Transverse mesocolon with stomach resting on it. 14. Terminal part of duodenum. 15. Descending colon. 16. Root of mesentery (cut). 17. Pelvic (sigmoid) mesocolon. 18. Pelvic colon (sigmoid flexure).

even the most recent, have utterly ignored this use of the colon in the diagnosis of abdominal diseases.

Roughly speaking, the ascending, transverse and descending portions of the colon constitute three sides of a square, and divide the abdominal cavity into four regions: the central region, surrounded by the colon; the superior, above the transverse colon; and the right and left lateral regions. A tumor originating in

one of these regions may crowd over into another, but it can do so only by displacing the colon, and it is the study of this displacement which enables us to determine as a rule the origin

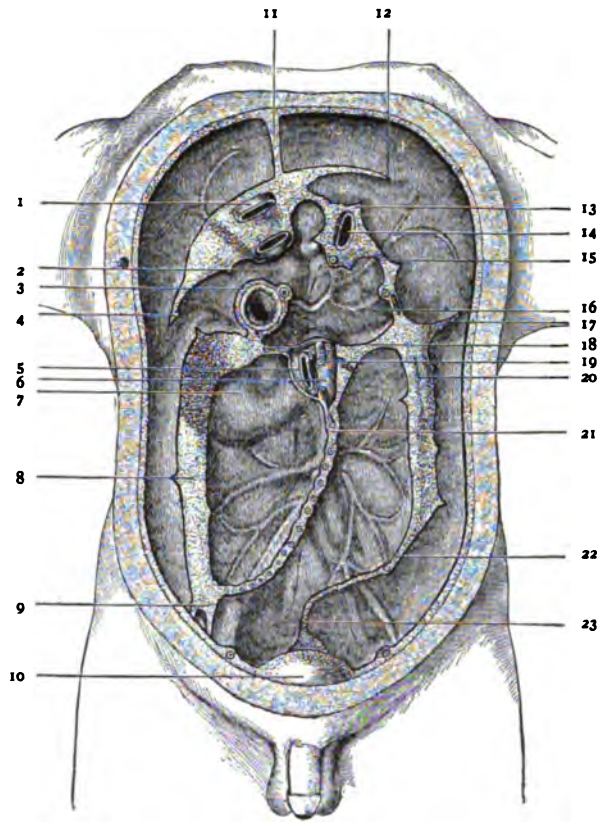

Fig. 2. Diagram drawn from same body as Fig. 1, showing how peritoneum is reflected from posterior abdominal wall over viscera and the resulting subdivisions of the abdominal cavity. (Cunningham.)

1. Vena cava. 2. Foramen of Winslow. 3. Duodenum. 4. Right lateral ligament of liver. 5. Duodenum. 6. Aorta. 7. Duodenum behind peritoneum. 8. Bare surface for ascending colon. 9. Commencement of colon. 10. Bladder. 11. Falciform ligament of liver. 12. Left lateral ligament of liver. 13. Gastro-phrenic ligament. 14. Oesophagus. 15. Gastro-splenic omentum. 16. Splenic artery. 17. Costo-colic ligament. 18. Trans. meso-colon. 19. Superior mesenteric artery. 20. Bare surface for descending colon. 21. Mesentery. 22. Sigmoid mesocolon. 23. Meso-rectum.

of the tumor. In the central area, in addition to tumors connected with the uterus and ovaries, will be found tumors of omentum and mesentery, of the retroperitoneal glands, of the small intestine,

and malignant, parasitic and other rare growths, the diagnosis of which must be determined, if at all, by other means; their relationship to the colon simply determines their location, not their character.

The colon can under ordinary circumstances be pretty accurately outlined by percussion, but when distended by air, which can be easily forced in through the anus by an ordinary bulb syringe, the outline can be determined with absolute certainty. While the colon itself may be displaced by other abdominal viscera and tumors, the mesocolon has its parietal origin pretty uniformly fixed. This natural attachment is shown in our standard works on anatomy. Bearing this colonic attachment in mind, and knowing its relationship to the abdominal viscera, the surgeon is in position to gain much information of a diagnostic character when trying to determine the origin of an obscure abdominal tumor, and it will seldom be necessary for him, if he is at all expert in physical diagnosis, to distend the colon artificially, though such a procedure will in obscure cases be essential.

Most abdominal tumors originate in the ovaries, uterus, kidneys, spleen, liver, pancreas or omentum. Taking these up in the order named, it will be found that the ascending and descending colon must necessarily be on the outside of tumors originating in either the ovaries or uterus. (In Vol. I., page 117, of Kelly's work on Gynecology, is pictured a case in which the sigmoid flexure of the colon seems to be attached from left to right along the anterior border of the pelvis, the uterus and its appendages being directly back of this portion. If this figure represents the correct attachment, the condition is certainly an anomaly, and of such rare occurrence that it may be ignored. It is hard to conceive, however, of such a possible attachment when one studies the embryonic evolution of the colon.)

The kidney is normally situated behind the colon. A tumor, therefore, originating in the kidney will develop between the layers of the ascending or descending mesocolon, and the colon will be found in front of the tumor or towards its inner side.

Tumors of the adrenals, and those developing in pararenal tissue, or from the Wolffian body, like those developing from the kidney, will produce an anterior or inward displacement of the colon.

A tumor developing in a movable kidney, while usually appearing first on the outside of the colon, may eventually enter the

central area so that the colon presents upon its outer side; but when the patient is recumbent, the kidney tumor will usually slip back into its original position unless held by adhesions.

Any tumor which displaces the ascending or descending colon forward or inward is in all probability a tumor of the kidney or of the adrenal.

The spleen must necessarily be on the outside of the descending colon, or, if greatly enlarged, will override it entirely. Bearing this fact in mind, it would seem as though there should be no difficulty in the differential diagnosis between tumors of the spleen and those of the kidney, or of the ovary; and yet such mistakes are being frequently made and by the best of men in the profession. In the JOURNAL OF OBSTETRICS, of April, 1902, is a report of three splenectomies which had been made at the Johns Hopkins Hospital. In each of these three cases the tumor had been mistaken for a neoplasm of another organ; in two of the cases the tumor was supposed to be ovarian, and in the third the diagnosis was made of a cystic kidney. In the report of these cases nothing is said to indicate that any examination was made to determine the relationship of the colon to these growths.

I have personally known of two physicians, sufficiently prominent to become presidents of a state medical society, and a third who was recently a president of the American Medical Association, to mistake a tumor of the kidney for an enlarged spleen, simply because they had ignored the landmark of the colon.

An enlarged spleen with its suspensory ligament and gastrosplenic omentum elongated, might perhaps, if the patient were in the erect position, be apparently located on the inner side of the descending colon; if, however, the patient were examined when recumbent, the spleen, in the absence of adhesions preventing it, would slip back into its proper position and then the colonic tympany could be easily made out toward the median line.

Enlargement of the liver crowds the colon down or overrides it. There should, therefore, be no difficulty in differentiating the liver from any tumor arising from the pelvis or from the kidney. The gall-bladder, being a part of the liver, also crowds down or overrides the colon. It may even when elongated hang down in front of it for a considerable distance. Without bearing these facts in mind it would be many times difficult to diagnosticate between an enlarged gall-bladder and a tumor of the right kidney, but remembering that the gall-bladder lies above or in front of the colon,

while the colon lies in front of, or somewhat to the inner side of, an enlarged kidney, the diagnosis as between these two is not difficult.

Recently I was consulted in a gallstone case in which the patient presented as a complication a tumor strikingly like an enlarged right kidney. This tumor was distinctly behind the colon, and ascended and descended with deep respiratory movements; and yet it was impossible to press the fingers in above so as to separate the tumor from the liver as can be done with the kidney. The diagnosis was therefore somewhat in doubt. The patient was a female who had perhaps laced in her younger days, and at the operation, at which a number of gallstones were removed, this peculiar tumor was found to be an elongated outgrowth from the right lobe of the liver extending downward on the outside of the ascending colon, the colon itself overriding it, as it was crowded over by the small intestines. Had we in this case resorted to inflation of the colon, it is probable that a correct diagnosis would have been made, although I doubt if this could have been positive.

Tumors of the stomach will, of course, crowd the transverse colon downward.

Tumors of the pancreas have almost always been mistaken for something else; almost invariably in the female for tumors of the ovary. A study of the relationship of the transverse colon in these cases would almost certainly have obviated the error, since in 95 per cent. (Harris) of these cases the tumor appears above the transverse colon. In a few cases it lies behind the colon, but even in these the fixed location of the transverse colon would render a correct diagnosis almost certain. In only a few cases has the pancreatic tumor projected above the stomach, between it and the liver.

A cyst of the extremity of the pancreas may appear behind the ascending or descending colon and thus simulate a tumor of the kidney; but ordinarily the transverse colon will suffer some displacement, and this may lead to a correct diagnosis.

In a case of cystic tumor of the tail of the pancreas which I had some years ago, the differential diagnosis lay between a cystic tumor of the pancreas, and a similar tumor of the left kidney, or of the suprarenal capsule. The fact that the urine from the left kidney showed evidence of a pyelitis, led me to rather favor the renal origin of the tumor, although some symptoms were lacking. Because of this uncertainty, an anterior incision was advised, and

this very quickly revealed the character of the cyst. It was opened and drained and the patient recovered.

Tumors of the omentum, if developing in its lower portion, cannot by their relationship to the colon be distinguished from tumors arising in the pelvis; their diagnosis must be determined, if at all, by exclusion.

Those rare cysts which develop between the folds of the mesentery or of the mesocolon, must be diagnosticated by other means than by their relationship to the colon alone, and as a rule their exact character is not determined until the operation.

DISCUSSION.

DR. J. HENRY CARSTENS, Detroit.—I think Dr. Baldwin has done well in calling our attention to the relation of the colon to abdominal tumors. It is of considerable value as a diagnostic point, but as he very properly says in his paper there are some cases in which it is difficult to distinguish one from the other. I once had a case of tumor of the spleen with a long pedicle, in which the spleen was attached to the posterior cul de sac. The woman had a number of fibroid tumors which extended to the vagina, and I naturally thought that the spleen was a part of a tumor, but when I got the mass up I found it was a floating spleen which had become attached and the colon was in the normal position, as in any case of fibroid tumor.

I have seen cases of cysts of the kidney that were attached to the left side, and one deep down in the pelvis, pushing the colon and everything over on to the right side, so that it was impossible at least for me to distinguish it from a cyst of the ovary. I have seen the colon absolutely pushed over on one side and back of the tumor. I have seen ovarian tumors develop on the left side, become firmly attached to the anterior abdominal wall, and work up to the kidney attaching on that side, but never developing on the right side, everything being pushed over on the right side—the colon and intestines, with the cystic growth between—and no one could tell whether it was the ovary or some other organ.

We get some patients who reside in the backwoods with an indefinite or no history of their condition, because they do not consult a physician until it is absolutely necessary for them to do so, and when they do call in one he finds perhaps a tumor. In such cases it is difficult, if not impossible, to get a history, hence the relation of the colon to the abdominal tumor is absolutely of no value in the diagnosis.

DR. L. H. DUNNING, Indianapolis.—In the closing portion of his paper Dr. Baldwin spoke of the difficulty of differentiating

between a cyst of the pancreas and of the kidney in some instances. I never believed this until recently, when I encountered a cyst of the pancreas which was situated at the outer extremity of the organ and freely movable. It was an echinococcus cyst which sprang from the pancreas and developed far over to the side, pushing the colon to one side, the descending part of the cyst being behind the colon. When held in a certain position and the colon extended over it, it seemed to me that it was a cyst of the kidney. I was so certain that it was a cyst of the kidney that before beginning the operation I plunged a needle into it. It was a tumor that had been present for a year and a half. I obtained no fluid. I then opened the abdomen and found that I had a cyst of the pancreas to deal with, which had developed between the transverse colon and the stomach and occupied in part the lesser peritoneal cavity. It was as large as a child's head, could be moved in almost any direction throughout the abdomen, and its attachment to the pancreas was so slight that we were able to extirpate it very readily.

DR. M. F. PORTER.—What did you introduce a needle for?

DR. DUNNING.—I am convinced it was wrong. I thought at the time I would confirm the diagnosis, as I was in doubt whether to remove the kidney or to drain. I now realize that it was folly to attempt to aspirate.

DR. BALDWIN (closing the discussion).—Dr. Carstens has stated the case as a man naturally would who has given the subject no very careful consideration.

The spleen, as I stated, is attached by its suspensory ligaments and by the gastro-splenic omentum. It is above and to the outside of the colon. Sometimes its pedicle may be very long, and a prolapsed spleen held by adhesions might readily be mistaken for some other organ, but in the absence of adhesions it will, in the recumbent position of the patient, drop back into its place. Two or three cases have been reported in which a spleen with such a pedicle has become adherent in the pelvis. In such cases a diagnosis would be difficult, if not impossible. But even in such cases, perhaps, if the colon is inflated and the hands of the operator follow the distention of the colon as air enters it, at the point where the pedicle of the spleen passes over the colon an obstruction would be found, which might lead to a suspicion of the conditions present.

The kidney is behind the colon, and as it enlarges it does so at the expense of the mesocolon, and ordinarily more at the expense of the outer leaflet, so that the colon lies in front of it and somewhat toward the inner side. An enlarged spleen (the larger the better) with its sharp edge overrides the colon, and if the colon is outlined by percussion, even without inflating it, it will be found to pass under the splenic tumor. If the colon is inflated this location becomes all the more prominent; whereas, if the tumor were a kidney, the colon would be found on its outer surface, but usually toward the median line. A kidney tumor will

be under the colon, a splenic tumor on the outside of it, overriding it.

In regard to the point brought out by Dr. Dunning: it is true that a tumor of either end of the pancreas might resemble a tumor of the kidney, yet if the colon is inflated the pancreatic tumor will be found in relation to the transverse colon, while the kidney tumor will be found in relation to the ascending or descending colon. In 95 per cent. of the cases, tumors of the pancreas appear above the transverse colon, between it and the stomach. A tumor of the suprarenal capsule would be more likely to be mistaken for a tumor of one end of the pancreas.

THE VALUE OF VAGINAL CESAREAN SECTION, WITH REPORT OF TWO CASES.

By M. STAMM, M.D.,
FREMONT.

To Dührssen of Berlin the credit is due for having introduced this valuable method into practice. No matter what others may have done before him he has laid down the rules and indications for the operation and given them the widest circulation. It was only through his writings that I became acquainted with them and I was struck by the efficiency of his method in a case of cancer of the womb, at four months pregnancy, about four years ago. I could at that time comprehend that it was destined to take the place of ventral Cesarean section in nearly every case where the soft parts formed the obstacle to delivery or where a narrow pelvis below 8 cm. could be excluded. The clinical reports of operations undertaken upon various indications seem to speak favorably of this method. Dührssen advised the operation first in *Allgemeine deutsche Aerztezeitung*, April 1st, 1895, Nos. 7 and 8, where he spoke of the treatment of eclampsia. He said that in convulsions during pregnancy it was important to empty the uterus as quick as possible, and this could be done by competent hands through an incision in the anterior wall of the cervix and the lower segment of the uterus. Again at a meeting of the Obstetrical Society of Berlin, July 10th, 1896, he said: "The vaginal Cesarean section, according to my view, can only be done at a clinic and with trained assistance, and it is indicated where a closed and undilatable cervix endangers the life of the mother and in rare cases that of the child." He then gave a description of his method of operating which he had followed in a case April 24th, 1896, at the normal end of pregnancy, on a patient upon whom vagino-fixation was performed some years before. The large size and transverse position of the child caused him some fear of serious trouble. In this case he made a longitudinal incision through the anterior and posterior uterine wall up to the internal os and drained the uterus

by a tampon. On May 29th, 1896, he presented the mother and child before the German Surgical Society and gave the following indications for vaginal Cesarean section:

1. Abnormal conditions of the cervix and lower segment of the uterus (carcinoma, myoma, rigidity, stenosis, partial pouch-like distention of the lower uterine portion).

2. Dangerous conditions of the mother which may be removed or relieved by prompt emptying of the uterus; affections of the heart, lungs and kidneys.

3. Conditions of the mother where death is imminent and can be foreseen.

The last two indications have only value in cases where the cervix is closed and not dilatable or where the depressing influence of labor pain should be obviated, as in affections of the heart and lungs. In pregnancy complicated with cancer of the uterus he advocated immediate vaginal section with subsequent extirpation of the uterus, no matter at what time of pregnancy or at what stage of labor this condition is encountered. His mode of procedure consists in curetting and cauterizing the carcinomatous tissue with thermocautery, then he ligates the basis of the parametrium on each side, the vagina is then separated from the uterine portion on all sides and, if necessary, the opening can be enlarged by an anterior longitudinal incision. The uterus is pulled down with tenaculum forceps and a rapid median incision made in the anterior and posterior walls of the uterus sufficiently large to extract the child. After the placenta has been removed the uterus is split further up and the anterior and posterior cul-de-sac opened so that the uterus can be grasped higher up with forceps and pulled down to tie or clamp the ligaments from above. The suturing of the peritoneum ends the operation.

His second case was a moribund woman, suffering from mitral insufficiency and dilatation of both ventricles, with a high degree of compensatory disturbance, very feeble pulse, orthopnea, cyanosis and extensive edema. The child was slightly asphyxiated. The operation lasted only about twenty minutes, but the condition of the patient was such that she could not endure the operation.

His third case of eclampsia was reported in *Centralblatt für Gynekologie,* No. 2, 1901, p. 54. Patient was in her sixth month of pregnancy; she died about twenty-three days after the operation, with symptoms of pulmonary tuberculosis and pneumonia, with a return of edema and albuminous urine. As the pelvic

organs had recovered their normal condition, he is justified in mentioning this case in his statistics as cured. He expresses the hope that he may see the time when the classical Cesarean section will be replaced by the vaginal section in grave cases of eclampsia, and advocates the latter method where the soft parts form a serious obstacle to labor, and the life of the mother or child is in danger, provided the cervix is closed or undilatable. In his monograph, "Der Vaginale Kaiserschnitt, 1896," he had already specified the indications for this operation plainly and comprehensively, and thought that, besides cancer of the uterus and eclampsia, uremia and premature detachment of the placenta, with internal hemorrhage, might call for it when the cervix is closed and there is an absence of pain. Retroflexion, pouch-like distention, or kinking of the gravid uterus might also furnish an indication. He also claims that, with such an operation under deep anesthesia, 75 per cent. are saved, in eclampsia; on the other hand, only 9 per cent. if left to spontaneous delivery.

Simon (*Munch. Medizin. Wochenschrift,* H. 21, 1903) reports three cases of vaginal Cesarean section. One case was operated on two years before for prolapse of the vagina and uterus, where anterior and posterior colporrhaphy, with amputation of the cervix, was made. The resulting condition, stenosis of the os uteri and vagina, complicated the act of confinement very much. Although the pains began three days before and the water had broken at that time, very little progress was made. The cicatricial stenosis of the os and the vagina proved too great an obstacle for spontaneous delivery. After having made an incision through the perineum and posterior vaginal wall, he made a sagittal incision in the anterior vaginal wall to the os uteri. As the cervix had been amputated before, there was some difficulty in hooking down the uterus. Close to the cicatricial border he separated the vagina from the uterus by a transverse incision and after having pushed the bladder up from the uterus he made a median incision of 10 cm. into the uterine wall which enabled him to grasp the head of the child with forceps and promptly deliver a living child weighing 8 pounds. The placenta followed soon, he then stitched the uterus up with eight deep silk sutures, the vagina with catgut and the perineum with silk sutures. Patient recovered fully and had no return of prolapse.

Case II.—A I-para, thirty years old, had labor pains for five days, water broke at the start. The os opened the first two days to admit two fingers and remained in that condition, though

the pains continued. They gradually became spasmodic, fever set in, and patient became exhausted. The doctor found the head in the pelvis and pushing the cervix before it, but it would only admit two fingers. He was unable to assign any cause for such a condition, unless it was the rigidity which is at times met in older I-para. As there were signs of a living child he concluded to make a vaginal Cesarean section. The pelvis was normal, tetanic contraction of the uterus, pulse very rapid, and general condition feeble and exhausted. The child was extracted with forceps after having made an incision into the perineum and anterior portion of cervix and uterus. The mother died three days later, but child is living.

CASE III.—A I-para, twenty-four years old, at the end of pregnancy, had eight convulsions without any sign of pain and was in a comatose condition. He made dilatation with metreurynter which caused slight pains but increased convulsions; two hours later he made vaginal section. The cord was prolapsed and pulseless; perforation of the head in this instance was considered the simpler way. Convulsions ceased, but coma lasted two days longer. Recovery of mother.

As I have mentioned before, Dührssen said that premature detachment of the placenta might also furnish an indication for vaginal Cesarean section. This soon found its practical application in a case reported by Ruhl (*Centralblatt für Gynekologie,* No. 47, 1901). Patient received a slight trauma to her abdomen the day previous. The following forenoon she had a few light pains, followed suddenly by a very severe pain as if something had ruptured inside; a moderate amount of blood was found in the vagina. Patient became unconscious and fell to the floor. One hour later Dr. Ruhl found the fundus uteri near the right border of the ribs; configuration of womb apparently normal, the right side of the corpus uteri, however, was more prominent. The fetal parts could not be felt distinctly, there were no movements, and the heartbeats were also extinguished. The vagina was filled with blood-clots; the cervix not obliterated; its walls were thickened and hard; the index finger could hardly be introduced; the membranes were intact, and became tense during pains; the placenta could not be felt near the os uteri. Patient regained consciousness and stated that her pains became harder. There was a constant trickling of blood and especially so during labor pains. Ruhl introduced a colpeurynter to dilate the os, but about fifteen minutes later patient became unconscious again and deathly pale;

the radial pulse was hardly perceptible. The anterior wall of the corpus and fundus uteri formed a projecting tumor of the size of a man's head, with a distinct elongated swelling, pointing toward the cervix. This led the doctor to the conclusion that there was internal hemorrhage, calling for immediate operation. Patient received saline infusions and the anterior and posterior wall of the cervix were incised, which caused no great hemorrhage. The time from the incision to the extraction of the child occupied six minutes. The placenta and large blood-clots followed spontaneously; hemorrhage ceased immediately after the uterus was emptied. Patient was in a precarious condition for about twenty hours; repeated saline infusions and injections of camphorated oil finally produced a change for the better. Ruhl thinks that the classical Cesarean section might present less technical difficulty in the hands of a surgeon not skilled in vaginal operations.

Another interesing case was recently reported by Ruhl, (*Centralblatt für Gynekologie,* No. 34, 1903) under the title: Hysterotomia vaginalis anter. for intense rigidity of the cervix, complicated by a tear in the lower uterine segment and parametrium. Patient, twenty-five years old, I-para, had been in labor five days before he saw her. She was extremely feeble; pulse 120 per minute; temperature 37.8°; she had constant pains; uterine walls very tense and sensitive on touch; contraction ring distinct, about three fingers width below the umbilicus. External genitals were not more developed than those of a girl twelve to thirteen years old, and exhibited no sign of pregnancy, such as swelling, softening, or discoloration. Pelvis, somewhat narrow, was funnel-shaped, vagina would admit two fingers. Head was in the pelvis, pushing the lower uterine segment before it. Cervix could hardly be reached; it was high up and far back in the pelvis; hard and not dilated at all; the external os was completely closed. The water had broken five days ago and there were tetanic contractions of the uterus. As there was danger of rupture of the uterus, he thought immediate delivery was indicated. There was some difficulty in bringing down the cervix and an effort to dilate it with instruments succeeded only so far as to admit one finger. He, therefore, made an anterior incision and delivered a living child by forceps. In spite of all care and multiple incisions into the vagina he tore the latter in two places and had also a perineal tear into the rectum. The hemorrhage was so severe that patient collapsed in one-half minute and, though the placenta was immediately removed, and the uterus had

contracted, the bleeding still kept up. The cause of the latter was found in a tear which started from the highest point of the anterior incision, in a transverse direction to the left side and lower part of the parametrium. These parts were immediately grasped by forceps, and, after a squirting artery was ligated, they were united by sutures, which checked the hemorrhage completely. The anterior incision and vaginal and perineal tears were also united and patient made a nice recovery.

Bumm was able to report in *Centralblatt für Gynekologie,* H. 52, 1902, thirteen cases of his own, with one death of the mother due to coma in eclampsia. The indications for his operations were cancer of the uterus in two cases, eclampsia in five cases at seven, eight, and nine months' pregnancy. One case of nephritis at the ninth month; another case of nephritis, complicated with mitral stenosis and insufficiency, was operated on in her sixth month of pregnancy, under local anesthesia, and greatly improved after this. One case of severe chorea, operated on in her fifth month was delivered of twins and relieved of her chorea in about one week. One case was operated on for hemorrhage in her sixth month of pregnancy, which was due to vicious insertion of the placenta. In two cases of flat, rachitic pelvis, artificial induction of labor was resorted to. Braun Fernwald (*Wiener med. Wochenschrift,* No. 28, 1898) made the operation on account of stenosis of the cervix and vagina; he made anterior and posterior incisions. Ehrendorfer reports a case (*Centralblatt für Gynekologie,* H. 16, 1903) where hyperemesis gravidarum formed the indication for operation at six months' pregnancy. The vomiting and salivation gradually ceased after one and one-half days and she made a nice recovery. Spinelli operated on a case in 1898 for cicatricial stenosis and hydramnios, with uncontrollable vomiting.

Dührssen reports another case of eclampsia (*Centralblatt für Gynekologie,* H. 16, 1903). The patient was a primipara; her legs and face began to swell about the end of January. On February 23rd, her vision became disturbed; she had severe headache and vomited twice a day. On February 26th, she had five convulsions; the vagina would only admit two fingers, was rigid and dark blue; cervix not obliterated and would only admit one finger. An incision in the right vagino-perineal region gave sufficient access to his fist. After he had made an anterior incision into the womb he found it necessary to make one also in the posterior portion to admit his hand. After version was made a living child was delivered. Half an hour later the placenta was re-

moved by pressure and as there was some hemorrhage due to uterine atony, a gauze tampon was introduced. The posterior incision required four, and the anterior five catgut sutures. The vaginal incision was stitched up with continued catgut sutures after having left a small gauze strip for drainage. The urine was free from albumin on March 1st and patient left the hospital in good condition on March 6th, 1903. To the above reported cases I can add one of my own, where I performed vaginal Cesarean section for eclampsia. Mrs. J. B., Bellevue, Ohio, age about thirty-five years, had four children. On April 22nd, 1903, at her seventh month pregnancy, she began to have convulsions at 8 o'clock P.M., and had about seven attacks before I saw her the next morning at 9 o'clock, with Drs. Richards and Harding. She was comatose since midnight; temperature 101°; pulse 95 per minute; she vomited several times; bowels moved three times. The cervix admitted the little finger, but an attempt at further dilatation with instruments proved futile, or, at least, would have been too slow. Two fatal cases in my practice gave me the conviction that more rapid delivery might have given better results. Whilst we were preparing for the operation, at the home of the patient, she had another convulsion. The posterior portion presented more favorably than the anterior and, owing to the surroundings and scant assistance, I thought I would follow the way which seemed the easiest for me, under the circumstances. On that ground I made my deepest incision into the posterior portion (about four and one-half inches long) and then a more shallow one into the anterior with the knife. Hemorrhage was not profuse, as I at once introduced my hand into the uterus, and made version. There was a little delay in getting the head of the child through the vaginal outlet, but the whole procedure occupied only about six minutes; the placenta was removed a few minutes later by pressure, and an iodoform gauze tampon introduced into the uterine cavity. The incisions were stitched up with catgut sutures and the whole operation was done in about twenty-five minutes. Patient rallied in a few hours; the child lived about one-half hour. I saw patient about two months later; she was in perfect health; a small portion of the posterior incision had not united; urine was free from albumin.

There are over sixty cases of vaginal Cesarean section reported so far; the majority of them were undertaken for cancer of the uterus, but the number performed for puerperal convulsions is also increasing rapidly, and it seems that this trouble will furnish

the chief indication for such an operation in the future. Most authorities seem to agree that rapid delivery is the most important measure to reduce the mortality in eclampsia. I also think that rapid dilatation with Bossi's dilator or similar instruments will be superseded in some measure by an operation, where the extent of incision or laceration is more under your control and where the wound gives more promise of healing by primary union.

The operative technic consists in exposing the uterine portion by a large speculum or retractors and grasping it by two pairs of forceps on either side of the os. A longitudinal incision of 5-7 cm. is then made in the anterior wall of the vagina, down to the os uteri. The loose cellular tissue is then opened with scissors, between the bladder and cervix. The bladder is pushed back, with a small piece of gauze, as far as the internal os, and, corresponding to that height, a sagittal incision through the anterior wall of the cervix is added. The upper margins of the wound are again grasped by forceps in a manner similar to morcellement and vaginal myotomy. This exposes a further portion of the womb, the bladder is pushed up more, and another incision is made through the lower segment of the uterus. If this maneuver is repeated a few times an incision of 8-12 cm. can readily be made under the guidance of the eye and without opening the peritoneum. This incision is generally large enough to admit the hand and to extract a mature child. Should it, however, not be sufficient, a similar procedure can be followed at the posterior portion. In the majority of cases it is probably the best to wait for the natural expulsion of the placenta, or if it does not follow soon some pressure upon the uterus can be used. This operation is, no doubt, best done at a hospital, but it can also be done at patient's home, in case of necessity, as my case proves. As a rule, the incision in the anterior portion is preferable; I could, however, see no special difference in my case, and would in the future be guided by circumstances. These incisions can be closed by catgut sutures or other material. Dührssen recommends uterine tamponade; others, again, reject it.

Since the writing of this paper I had an opportunity of operating on a second case of puerperal eclampsia. Mrs. F. S., age twenty-five years, I-para, pregnant eight months, complained of headache for a few days. On September 6th, at 4 o'clock P.M., she began to have convulsions, and had about five before I saw her, with Dr. Stierwalt, at 8 P.M. The doctor had given her one-half gr. of morphine a short time before. She was in a deep

stupor, but could be aroused for a few moments. The head was down in the pelvis, pushing before it the anterior portion of the womb, cervix partially obliterated, would admit two fingers. She had no pains; temperature 98.4°; pulse 114 per minute; urine thick with albumin; it was like a boiled egg. As I did not wish to operate in the country and by lamplight, if it possibly could be postponed, we concluded to wait till daylight and to give her morphine or chloral, in case of necessity. She was brought to the hospital about 6:30 o'clock the next morning, and had, in all, about eight convulsions; was cyanotic; tongue bleeding, dark and covered with dry crusts; some puffiness about her eyelids. Operation began about 7 o'clock; anterior incision was made about three inches long, bladder was pushed up further, but as tissues seemed so brittle I thought it best to make also a posterior incision about 4½ inches long; this admitted my hand, so that version could be made readily; child was delivered in about seven minutes; it took only a few gasps, but did not revive. Hemorrhage was not severe; placenta was removed five minutes later by pressure; operation lasted a little over one-half hour. Four catgut sutures united the anterior incision, and six the posterior. There was a shallow tear of the perineum, which extended also through the wall of the vagina, nearly up to the parametrium; this was united by continuous catgut suture. Salt solution and camphorated oil were injected; pulse 110 per minute; temperature normal. Consciousness returned, somewhat, about 6 o'clock P.M., the day of operation. Esbach's albuminimeter showed about 10 grams of albumin, after an equal quantity of water had been added to the urine; the next day it went down to ½ gram. Patient has still some albumin in the urine.

THE LIMITATIONS OF CESAREAN SECTION.

By E. GUSTAV ZINKE, M.D.,
CINCINNATI.

THE subject of Cesarean section has received great and well-deserved attention by the profession during the past few years. The reason for this lies in the gradually extended limits of its application in consequence of antisepsis, asepsis and improved technic of operation.

Hysterotomy, for the purpose of emptying the pregnant uterus during the period of viability or at term, is no longer a rare occurrence and has ceased to be, even when successfully performed for both mother and child, the wonder of the day. But not only the profession at large, but also the teachers of obstetrics stand remarkably divided as to the proper sphere of usefulness of this operation. There are those who believe that Cesarean section is performed entirely too frequently, and others who assert that it is not resorted to often enough. Both sides are honest in their contentions.

The author of this paper does not expect to bring about a perfectly harmonious view on the subject by what he may have to say at this time. What he hopes to accomplish by this effort, and the discussion which will follow, is to bring about a better understanding concerning the conditions calling for the operation. The writer does not for a moment doubt that, occasionally, though very rarely, the operation is performed unnecessarily. (This is true of any operative procedure.) But he is also firmly convinced that, more often, Cesarean section is performed entirely too late, sometimes discarded altogether, or not considered at all, even in the presence of well-marked relative indications.

The "horror" of the operation, belonging to the preaseptic period, still exists in the minds of many, and there appears to be a prevailing apprehension that, if the operation receives a more liberal endorsement on the part of obstetric authors and teachers,

it will be too often and indiscriminately performed, and thus result in a fearful mortality. Others have maintained that, with the more frequent adoption of Cesarean section, the science of obstetrics must suffer, and that there is great danger that the art of using the forceps, version, gradual and forcible dilatation, etc., will be lost. This solicitude on the part of some writers and teachers, certainly portrays a sad and serious want of faith and confidence in the ability, character, skill and judgment of the profession. Time and experience, it is hoped, will demonstrate that this is not so and that, upon calm consideration and prolonged reflection, all that is presented in this paper will, if not at once, finally receive the sanction of all who are deeply and honestly interested in this subject.

The author has been a teacher of obstetrics for more than 15 years, and has had a personal experience extending over 28 years, comprising 3,000 labor-cases, in both hospital and private practice. He has had, then, ample opportunities of observing for himself in hospital and out-door clinic work, in his own practice and in the practice of others, the different phases of the phenomena of labor under all the varying conditions of the numerous difficulties which complicate pregnancy, labor and confinement, and of witnessing the results of the various methods of treatment instituted for their relief. Because of this, he takes the liberty to speak upon this subject, without making an apology at home or writing to Europe for advice. You will kindly pardon this personal reference. It would not have been made except for the unkind and unjust criticism upon the writer's paper (Is Cesarean Section Justifiable in the Treatment of Placenta Previa?) read before this Association two years ago.

Nothing could be more advantageous and, indeed, more absolutely necessary than to be well acquainted with the work of the best men here and abroad. The writer has the highest regard for adverse criticism offered by men in authority and the multitude of *opinions* and *beliefs* expressed by timid, inexperienced and prejudiced men, practitioners and operators of limited observation, yet ever anxious to be heard, can be safely passed over by those whose judgment has been formed and matured by a long and studious past, rich in experience gained by actual and oft repeated contact with every variety of complicated labor.

The principal basis of this paper is an analysis of 88 Cesarean sections (including eight Porro operations) which have been reported by 52 different authors since January, 1900. The causes

for which the operation was performed are, in the order of their frequency, as follows:

For pelvic deformity		28	times.
Namely:	Flat rhachitic pelvis	13	
	Uniformly contracted, and rhachitic pelvis	7	
	Irregularly contracted, rhachitic pelvis,	4	
	Flat rhachitic pelvis complicated by eclampsia	3	
	Flat rhachitic pelvis complicated by tumor	1	
For justo-minor or uniformly contracted pelvis		12	"
" fibroid tumors obstructing labor		11	"
" eclampsia		6	"
" hysteropexy		6	"
" cicatricial contractions of vagina		5	"
" causes not stated		4	"
" simple disproportion between fetal head and pelvis, and lack of expulsive power		3	"
" carcinoma of cervix		3	"
" carcinoma of rectum		2	"
" placenta previa		2	"
" retrodisplacement, impaction and adhesion of fundus		2	"
" gunshot passing through gravid uterus		1	"
" ovarian tumor obstructing labor		1	"
" threatened rupture of uterus		1	"
" congenital displacement of kidney		1	"
		88	

Among the 13 cases of flat rhachitic pelvis is Coakley's case in which the operation was done three times in six and a half years, and Ill's case in which the operation was done twice in one year.

Of these 88 cases, 66 mothers and 56 children lived. In seven instances, however, it is not stated whether the mother lived or died, and in thirteen the same information is wanting as to the child. In the consideration of the maternal and fetal mortality, the cases where there is no reference as to the result to the mother and child were excluded. Thus we find that out of 81 mothers, 66 lived=81.5 per cent. Again, we find that the cause of death in five of the mothers was really due to malignant disease and the patients virtually recovered from the effects of the operation, death taking place two months, four months, one year and two years, respectively, after the operation. Counting these five cases as recoveries, 71, not 66, mothers lived. Maternal mortality = 12.34 per cent.

Of the 90[1] children born, 56 lived. If we exclude the thirteen cases where the result as to the child has been omitted, the fetal mortality amounts to 49 per cent. But a careful study of all cases reveals the fact that three of the children were dead before the operation; two succumbed during the operation; seven died within 24 hours; four within 48 hours; three lived two weeks, and one died of enteritis at the end of three months. If, then, we add to the list of children surviving the operation those who lived 24 hours and over, fifteen in all, the immediate fetal mortality is reduced to 25.26 per cent.

Those who claim that Cesarean section is performed too frequently will at once maintain that a maternal mortality of 12.34 per cent. and a fetal mortality of 25.26 per cent. are sufficient to prove the gravity of the operation and that, for this reason, it should not be resorted to as often as it is. Those who assert that the operation should have a wider field of application argue, and with good reason, that the apparent still high maternal and fetal mortality, is not due to the operation *per se*, nor to the cause for which it is performed; but rather to long delay, previous (injudicious, often awkward) futile attempts at delivery, lack of skill and experience of the operator, and imperfect preparation of the patient and her surroundings. All of these pave the way to excessive exhaustion, severe shock, profuse and repeated hemorrhage, and violent sepsis.

Many of those who oppose an extension of the limits of Cesarean section, resort to the same arguments (and occasionally ridicule and abuse) that were heard years ago against ovariotomy, salpingo-oophorectomy, hysterectomy and, of late, of appendectomy and other operations of recent date.

[1]There were two pairs of twins.

When two years ago the author advocated, before this Society, the adoption of Cesarean section for certain cases of central placenta previa, there was quite a marked and weighty opposition, and but few supported the speaker in his recommendation of the operation for this always alarming obstetric complication. Much has been said and written against it since, and still to-day, nearly every new text-book on obstetrics and other recognized authorities on this subject admit that Cesarean section may be justifiable under favorable conditions in the class of cases of placenta previa then referred to.

The experienced, conscientious and scientific obstetricians avoid, whenever possible, operative interferences and they enjoy nothing better than the successful termination of a case of labor without manual or instrumental intervention. The charge that they are actuated *"by a desire to perform an operation,"* is uncalled for and unjust. However, it is not the intention to weary you with the "pros" and "cons" of the past and present. The object of this paper is to determine, as accurately as possible, the limits of the sphere of usefulness of Cesarean section in the light of recent advances in operative obstetrics, and for the sole purpose of obtaining the best results for both mother and child under the most trying circumstances.

The writer has endeavored to present the absolute and relative indications for Cesarean section (and the Porro-operation), in the form of a chart appended below. In this chart, under the head of *"In uniformly contracted pelvis"* may be included the pelvis of the true and hypoplastic dwarf and the contracted pelvis due to absence of the bodies of the sacral vertebra. Under the head of *"In simple flat rhachitic pelvis"* may be included the chondrodystrophic and the rhachitic dwarf pelvis and the spondylolisthetic pelvis. The excessive kyphotic, the kyphorhachitic, the scoliorhachitic, the kyphoscoliotic and the kyphoscoliorhachitic pelvis, not infrequently furnish strong indications for Cesarean section. Their management is the same as that given under the heading of *"In obliquely contracted pelvis"* and *"In transversely contracted pelvis."* The indications for Cesarean section in cases of pelvic deformity due to osteomalacia and morbus coxarius, may be considered under the same headlines. Other diseases of the bony and soft parts of the pelvis, as well as the different conditions calling for the operation, have been considered under separate heads. An interrogation mark has been placed after *"Induction of premature labor"* because its propriety is

THE ABSOLUTE AND RELATIVE INDICATIONS FOR CESAREAN SECTION.

(RESPECTIVELY, THE PORRO-OPERATION.)

IN UNIFORMLY CONTRACTED PELVIS.

Conjugata vera.	Child living.	Child dead.
Below 6.5 cm.	Indications for Cesarean section absolute at term; or Induction of abortion. (?)	
6.5 to 8 cm.	Cesarean section, relative.	Craniotomy.
8 to 8.5 cm.	Induction of premature labor, 32d — 34th week. (?) Cesarean section, relative, 34th — 40th week.	Craniotomy.
8.5 to 9 cm.	Induction of premature labor, 34th — 36th week. (?) Await spontaneous birth. Eventually: Forceps, symphysiotomy or Cesarean section.	Await spontaneous birth. Eventually { Forceps, Perforation or both.

IN OBLIQUELY CONTRACTED PELVIS.

All depends upon amount of contraction and size of child.	Await spontaneous birth. Eventually: Forceps or, if the contraction is very great, Cesarean section. Induction of premature labor. (?)	Await spontaneous birth. Eventually { Forceps, Craniotomy or both.

IN SIMPLE FLAT, RHACHITIC PELVIS.

Below 6.5 cm.	Indications for Cesarean section absolute at term; or Induction of abortion. (?)	
6.5 to 7.5 cm.	Cesarean section, relative.	Craniotomy.
7.5 to 8 cm.	Induction of premature labor between 32d — 34th week. (?) Cesarean sect. 34th — 40th week.	Craniotomy.
8 to 8.5 cm.	Induction of premature labor 32d — 34th week. (?) Prophylactic version 36 — 40 week. Cesarean section, relative, at home.	Craniotomy.
8.5 to 9 cm.	Await spontaneous birth. Eventually { Forceps, Symphysiotomy or Cesarean section.	Await spontaneous birth. Eventually { Forceps, Perforation or both.

IN TRANSVERSELY CONTRACTED PELVIS

All depends upon amount of contraction and size of child.	Await spontaneous birth. Eventually { Forceps, Version or Cesarean section. Induction of premature labor. (?)	Await spontaneous birth. Eventually { Forceps, Craniotomy or both.

THE ABSOLUTE AND RELATIVE INDICATIONS FOR CESAREAN SECTION.

(RESPECTIVELY, THE PORRO-OPERATION.)

IN THE ABSENCE OF PELVIC CONTRACTIONS AND OTHER DEFORMITIES, CESAREAN SECTION IS ABSOLUTELY INDICATED:

In tumors of the uterus
" " " ovaries
" " " soft and bony parts of the pelvis
" congenital displacement of the kidney

} When their presence and situation is such that the child cannot pass through the parturient canal at all or not without great danger to the mother, and when the tumor cannot be removed.

" excessive antiflexion of the uterus due to ventrofixation.
" " retroflexion " " when complicated by fixation or impaction of the fundus.
In advanced carcinoma of the cervix, vagina and rectum, singly or combined.
" *articulo mortis* or immediately after the death of the mother and the child living.
" extensive and unyielding cicatricial contraction of the vagina and cervix.
" perforating injuries of the uterus. (Gunshots, stabs, cattlehorns, etc.)

CESAREAN SECTION MAY BECOME AN ELECTIVE PROCEDURE IN CASES OF

Threatened rupture of the uterus, when forceps has failed or cannot be applied, and version is too dangerous.

Advanced disease of the heart, lung, kidney, etc.
Placenta previa.
Ablatio placenta.
Eclampsia.

} During the period of viability or at term, when the os is very rigid or the cervix elongated and hard, when the attitude of the child is unnatural, rapid delivery imperative, and shock as well as hemorrhage to be avoided.

CESAREAN SECTION SHOULD BE FOLLOWED BY HYSTERECTOMY:

In the presence of diseased uterus. Tumors; carcinoma (if localized); sepsis; atony of uterus (hemorrhage).

CESAREAN SECTION IS CONTRAINDICATED:

When the life of the mother or child (or both) has been fatally compromised.
When the child is dead.
When sepsis is present, and general infection cannot be avoided.

} In the absence of the absolute indications only.

WHERE AND BY WHOM SHOULD THE OPERATION BE PERFORMED?

WHERE?

In a modern hospital always, if possible.
At home, only if asepsis can be secured, or, when, in the presence of the absolute indications, it is impossible to convey patient to a hospital.

BY WHOM?

Always by one possessing the necessary skill and experience in the treatment of these cases.
By one less efficient only, when it is impossible to obtain the services of an adept surgeon and in the presence of the absolute indications alone.

doubted by many and the author himself is convinced that better results, for both mother and child, can be obtained by Cesarean section properly performed at, or near, the end of term.

The 88 cases of Cesarean section referred to in the paper may be found in the *American Journal of Obstetrics and Diseases of Children,* Vols. 41, 42, 43, 44, 45, 46, & 47. The following are the reporters of the same: Weber, Thorne, Walker, Joshua, Biermer, Graffs, Batchelor, Hillmann, Olshausen, Freund, Hirst, Nietert, Draghiesco and Christian, Prokess, Kittredge, Routh, Costan and Payran, Baldy, Webster, Roberts, Williams, Boyd, Broadhead, Backhaus, Hare, Macleod, Campbell Wilson, Loffler, Dickinson, Routier (reports for Lambray), Pape, Davis, DeLee, Coakley, Glass, Ill, Fredericks, Coles, Norris, Kidd, Hepperlen, Boquel, Spencer, de Paoli, Bidone, Levinge, Jurowski, Brown, Heinricius, Zinke, Bonifield, Truesdale.

DISCUSSION ON THE PAPERS OF DRS. STAMM AND ZINKE.

DR. CHARLES S. BACON, Chicago (by invitation).—I believe the operation to which Dr. Stamm has called our attention is really a valuable addition to our means of treating certain cases. The history he has given shows that the operation has been developed in the right way. It has been eight years before the profession, and while it was not adopted with great enthusiasm at first, gradually it is becoming more and more used. Particularly for the indication for which it was first employed—namely, cancer of the uterus, it is undoubtedly of great value, and also perhaps in cases where Cesarean section is indicated for other reasons, where there is no contraction of the pelvis, but where there is fear of sepsis. The same indication applies here as in cancer—the fear of sepsis, which is the chief danger of abdominal wounds. In premature detachment of the placenta, a complication which often defies all usual treatment, that operation seems to be the ideal one. When, however, we come to consider the operation in placenta previa, there will be the same objection that has always appeared to the typical operation. The other means of treating placenta previa are so perfect, so far as the mother is concerned, that it will be only in the hands of a very competent operator, and in probably rare instances, that this operation or the typical one would be chosen.

When we come to the consideration of puerperal eclampsia, we have ground to hope for good results from either of the operations, and it is certainly of great importance to study the question

as to the proper management. I believe, personally, there is a future particularly for the vaginal Cesarean section in cases of puerperal eclampsia, but only in those cases that are very carefully selected. The case related by Dr. Stamm (I believe the last one) was hardly a case for the vaginal Cesarean section. In that case I understand the cervix was obliterated and partially dilated, hence it was unnecessary to resort to Cesarean section. In such a case bloody dilatation by deep incisions up to the vaginal junction would furnish all the necessary room. It would be quicker, and therefore preferable to Cesarean section. It is only in cases in which the cervix is not obliterated that vaginal Cesarean section would come into question, and here in cases where the attack seems to be one of great severity, where one convulsion follows another, when there have been only one or two convulsions, and the patient is not profoundly intoxicated, it is hardly desirable to risk the more serious operation.

As to the technic of the operation, it was stated that in some of the operations the peritoneum was stripped off the uterus without incising it. In cases of sepsis this might be desirable, but generally it is best to make the incision through the peritoneum.

In regard to Dr. Zinke's paper, those who have had experience with the induction of labor in cases of moderate pelvic contraction and have not only induced the labor at the right time, but have cared for the child at the right time and in the right way by observing all the technic in caring for a premature child, will not be persuaded to abandon that method in certain cases. It is safe for the mother in properly selected cases where the previous history has been carefully considered. It is safer for the mother, and nearly as safe for the child. In spite of all improvements there is some risk in making Cesarean section.

One other thing I would suggest in the chart, which is in itself very valuable, is the separation of the indications according to whether the woman is bearing her first child or whether she has borne children before. We ought never to induce labor or to prepare for and make a section at the beginning of labor in women who have not borne children previously, particularly in cases of moderate degree of pelvic contraction. It is quite frequently the case, as we all know, that a woman will bear a child spontaneously with a considerable degree of contraction, after we have prepared for a serious operation. In case the first labor is difficult and the uterus has been injured by a long and severe first labor, then we should prepare for and carry out the section without waiting for the results of a useless labor.

DR. WALTER B. DORSETT, St. Louis.—This subject is a very interesting one. Some time ago I had a case of placenta previa in a woman six months pregnant. She first began to lose amniotic fluid and later lost a great deal of blood. In making an examination I found placenta previa lateralis, with possibly an inch of the margin of the placenta grown over the edge of the cervix. Having been called in without any chance to prepare my obstetric

bag, I had to tampon as quickly as I could, and within five or six hours after I got to the house I made the incisions indicated by Dr. Stamm—that is, I made incisions anteriorly, posteriorly and laterally, and delivered a child at six months and ten days.

It seems to me from what I gather from the essayist that these operations are advocated more particularly in cases of malignant disease of the cervix than for placenta previa, but my experience with placenta previa prompts me to believe that possibly it is equally applicable in placenta previa cases. Of course, in making an incision in placenta previa cases we first locate the placenta and then make our incision on the opposite side, not necessarily in front between the bladder and uterus, but on one side or the other, and produce podalic version as quickly as possible.

As to the paper of Dr. Zinke, I agree with him so fully in everything he has said that there is no necessity for me to discuss it.

DR. FREDERICK BLUME.—May I ask Dr. Dorsett whether he would advise incision of the cervix in a six months' gestation in a case of placenta previa, and whether he would practise that in every case?

DR. DORSETT.—Yes, I would, in every case of placenta previa, in the light of the experience I have had.

DR. EDWIN RICKETTS, Cincinnati.—Dr. Stamm spoke of having administered in a case of puerperal eclampsia morphia and hydrate of chloral. Just at that point, before the anterior and posterior incisions are resorted to, as suggested by Dr. Stamm, I think it would have been wise to follow it up by the administration of veratrum viride in the doses that are prescribed at the present time. I take issue with him on the point before making these incisions in puerperal eclampsia, in the case in which both of the children were lost.

DR. J. HENRY CARSTENS, Detroit.—These two papers have special indications. The first one, read by Dr. Stamm, had reference to cases of normal pelves. When we have a contracted pelvis, vaginal section is out of the question, unless we have to deal with a case of five or six months' pregnancy. This method of vaginal Cesarean section is the remedy in cases of puerperal convulsions. But in a case of puerperal convulsions where the woman has one convulsion and then recovers consciousness, it requires premature slow delivery; but in a case of puerperal convulsions where the woman has one convulsion after another and is unconscious, as in one of my recent patients, one subject to retinitis pigmentosa, who could just see light in both eyes, and I was afraid she would not recover her sight, different treatment is necessary—namely, prompt delivery. In cases of cancer, adherent to the pelvis, rectum and bladder, it is dangerous. Those are the cases that require Cesarean section, as Dr. Zinke said. So, it really amounts to this: vaginal Cesarean section is indicated in a normal pelvis with puerperal convulsions of a severe type.

I should like to say a word or two about cutting in three or four directions. In some cases I find it is the internal os that we have

to open up, hence it becomes necessary to cut as high as that. If you do that your opening is sufficiently large to introduce the hand and turn, or if the placenta is cut and you apply forceps and deliver the head, you will tear more than your incision, and what do you do? You tear into the leaflets of the broad ligament sometimes, if you make incisions in the side of the uterus. You tear the uterine arteries and you may have a great deal of trouble in controlling the hemorrhage, therefore, I very much object to cutting on each side, but I believe in cutting in front, and in rare cases in cutting behind; through an anterior incision you can run high up if you stay in the median line, thereby having very little trouble from hemorrhage, which you can easily control.

In reference to Dr. Zinke's paper, I think the diagrams are excellent, except they are a little too fine, particularly when he says that with a pelvis of six and a half centimeters we must do one thing, and with seven centimeters we must do something else. In one case you can do with six centimeters what you can do in another case with eight centimeters, but in some cases you cannot do with the one what you can with the other. You can take the measurements accurately, but much would depend upon the size of the child. The head is larger in one case than it is in another. Sometimes if a woman has had two or three children she may require craniotomy, and if she has nine centimeters and gets into the hands of the right kind of man, she is a great deal safer with Cesarean section than she is by having to undergo any other kind of operative procedure. Furthermore, a good deal depends on the woman. Sometimes we have a narrow pelvis to deal with. We have a premature delivery at the seventh or eighth month. The woman wants a living child and she will consult someone and say, "I have had three or four dead children, but I want to take the chances of having a live one."

With reference to what Dr. Zinke said about ovarian and uterine tumors, I will say that we have to deliver women who have ovarian tumors and we deliver them without any trouble. If an ovarian tumor on one side is small and does not grow rapidly, you can let the woman go on to term and you can deliver her safely. If she has fibroid tumors at the fundus she can be delivered safely without Cesarean section, provided she has a normal pelvis. Dr. Zinke should qualify his remarks and speak of uterine tumors that are situated in the cervix and obstruct labor, and then he will be beyond criticism.

DR. RUFUS B. HALL, of Cincinnati.—For the benefit of Dr. Carstens, I will read a portion of the remarks of Dr. Zinke as given in the printed chart in speaking of Cesarean section and the presence of tumors. He says that the operation is indicated when their presence and situation are such that the child cannot pass through the parturient canal at all, or not without great danger to the mother, and when the tumor cannot be removed. Dr. Carstens overlooked this.

DR. CARSTENS.—I retract all I said on that point.

DR. HALL.—I wish to speak of another point. In one place in the bottom of the chart Dr. Zinke recommends that Cesarean section be followed by hysterectomy in the presence of a diseased uterus—tumors, carcinoma, if localized, sepsis, atony of the uterus, hemorrhage, etc.—and emphasizes the necessity of doing the right thing at the right time. This means as much or more in Cesarean section than in almost any other operation inside the abdomen. If we do Cesarean section late there is danger of infection and sepsis, and to emphasize what I mean I will report a case briefly.

I was asked to see a patient at Xenia, Ohio, a year or more ago. Dr. McClellan, who asked me over the long-distance telephone to see the patient, stated that she had been in labor two or three days; that she lived seven miles from Xenia, and had been placed in an express wagon on a bed and brought to the hospital at Xenia. He asked me in the middle of the night if I would operate on her. I said, "Yes." I left on the first train and reached Xenia about daylight. Everything was ready for the operation. I examined this patient and found she had a fibroid tumor in the lower segment of the uterus, which completely filled the pelvis. By vaginal examination the tumor presented like a child's head in the second stage of labor. The cervix could not be found. The amniotic fluid was discharged early in labor. She was supposed to be seven months pregnant. It was her first child, yet she had been married sixteen years. There was a foul-smelling discharge escaping from the vagina. She was greatly prostrated from the long labor, yet she had been relieved materially by large doses of morphine. I got ready for the section as soon as possible and opened the woman's abdomen. The whole peritoneal cavity and half of the uterus were of a dark purple color. Conditions looked desperate. The child was dead, so I proceeded to do hysterectomy without opening the uterus, for fear of infection. There was great difficulty in getting the tumor out of the pelvis, but I finally succeeded in so doing. The woman recovered, but not easily, and left the hospital at the end of four or five weeks. She has since remained well.

The only further point I wish to make is to emphasize the fact that the mortality in Cesarean section is very great if there have been attempts at delivery by forceps; if the woman has been in labor a long time, and if version and other manual manipulations have been tried. If we are to do Cesarean section with a low mortality to the mother and child, we ought to do it before attempts at delivery have been made by the natural passages.

DR. CHARLES L. BONIFIELD, Cincinnati.—It seems to me these papers might better have been discussed singly as they deal with different subjects. Vaginal Cesarean section, which the author of the first paper advised, is certainly valuable in one class of cases—namely, those cases in which there is danger of infection in doing the suprapubic operation. In cases of cancer of the cervix, as Dr. Carstens has said, where the uterus is immovable and the pel-

vis is filled with the cancerous mass it is impossible to operate in this way. Where an operator is called to see a case and finds that numerous vaginal examinations have been made by the midwife or attendant, there is great danger of infection already existing. Here the vaginal operation is a valuable procedure, no doubt. In other cases ordinary Cesarean section is so easy that it is infinitely preferable to vaginal. By it we avoid the delay in delivering the child through the pelvis, and the danger in a clean case must be slight, indeed.

As to the other indication which Dr. Stamm gave for the use of vaginal Cesarean section, and the one which Dr. Carstens emphasized—namely, puerperal convulsions—such cases in which there is any necessity for resorting to this measure are, indeed, rare.

Dr. Ricketts spoke of the use of veratrum viride in these cases, and Dr. Carstens by implication said that the cases which veratrum would control are those where the patients have had one convulsion, and would not have any more. There is practically no case of puerperal convulsions that cannot be controlled by veratrum if the man who is giving it has the courage to give enough of the drug. He should not be governed by the number of minims of the fluid extract administered, nor by the quantity of the tincture, but simply by the physiological effect. Physicians around Cincinnati use veratrum a good deal, and I know of no case in that neighborhood where veratrum has been given in sufficient quantity to keep the pulse below 60 in which the convulsions have not been controlled.

I saw a case in Ohio some years ago where a patient was unconscious for three days, in whom under the proper administration of veratrum, together with emptying the uterus, consciousness returned in a short time, and recovery ensued. I think veratrum had much more to do with it than emptying the uterus. The use of this drug somehow seems to have gone out of fashion, and not enough of it is given. For some reason medical men are afraid to give it in doses that will produce the desired effect. If we expect any results from veratrum, it must be given in doses sufficient to lower the pulse to about 60.

DR. HAYD.—Permit me to ask Dr. Bonifield how he would begin its administration?

DR. BONIFIELD.—It would depend upon the size of the patient, but in an ordinary case with convulsions I would give thirty minims of Norwood's tincture hypodermatically, repeat half the dose in thirty minutes more, and keep on giving it every thirty minutes until the desired effect is obtained.

DR. FREDERICK BLUME, Pittsburg.—I would like to say a few words in reference to the paper of Dr. Stamm. In the first place, I do not think the term vaginal Cesarean section is a good one. By Cesarean section we understand the delivery of a child not through the normal channel. The operation discussed by Dr. Stamm is simply the dilatation of the cervix with the view to ex-

pedite normal labor, or to render possible the application of the forceps—conditions which, under certain circumstances, are accomplished by the use of the colpeurynter or even by the finger. To name such a procedure vaginal Cesarean section leads to confusion.

In the second place, the indications for the so-called vaginal Cesarean section are not sufficiently explained by the essayist. It seems to me the cases are rare which require this procedure; at least I have never found it necessary to resort to it in my own work, and I have had a fair share of obstetrical practice. Of course, if a woman has been in labor five days, as in the case reported by Dr. Stamm, the justifiability of this method of delivery cannot be questioned.

Dr. Dorsett mentioned that in a case of placenta previa lateralis, after the escape of the amniotic fluid, he incised the cervix and delivered a six months child. That such a treatment is permissible if the hemorrhage cannot be otherwise controlled is beyond dispute, yet such cases are extremely rare. It should be the aim of the obstetrician not to interrupt pregnancy in order to save the life of the child. Hemorrhage usually follows the escape of amniotic fluid in cases of placenta previa lateralis, even in the early stages of gestation. It is caused by a loosening of the placenta due to the diminution of the size of the uterus, which naturally results from the escape of the amniotic fluid, and it usually ceases as soon as the uterus has adapted itself to the decreased size of its contents.

With reference to the excellent paper of Dr. Zinke, I think what he has said agrees with the views of the majority of obstetricians and gynecologists of the present day.

Dr. Walter B. Dorsett, St. Louis.—I want to correct Dr. Blume. I do not believe he will agree with himself if I explain a little further. In the case of placenta previa lateralis that I reported there was marginal implantation of the placenta. I have seen many of these women bleed after the amniotic fluid has come away. In cases of marginal implantation of the placenta, where the diagnosis is unmistakable, if you let those cases go, you will lose many of them from sepsis. If you have a case of placenta previa and do not deliver, but hope for nature to bring on a delivery, it is very likely the patient will die from sepsis. Those are the cases that are prone to sepsis.

Dr. Miles F. Porter, Fort Wayne.—If I understood Dr. Stamm correctly, he said that he visited the woman at about eight o'clock in the evening, and concluded not to operate until the next morning. Then he made a vaginal incision, without any attempt to deliver the woman in the ordinary way. If this is correct, in my opinion it is a long way from being either good surgery or good judgment. The woman might have been delivered by the usual method before morning and thus time would have been saved and a major surgical operation avoided.

Dr. James F. Baldwin, Columbus.—We are governed in our

actions too much by authority. As an illustration, we have been told over and over again that thyroidectomy is especially dangerous under general anesthesia. This statement seems to have originated with Kocher, who lost a few of his earlier cases under general anesthesia and attributed the result to the anesthesia and not, as he probably should have done, to his imperfect technic. I recently corresponded with a surgeon who had been writing on this subject, and had taken the same ground as to the use of general anesthetics, and I asked him for some arguments as to why general anesthesia was improper. He promptly replied, saying that he would let me hear from him a little later when he had more time to go into the subject. Soon after this, however, I saw a surgeon who had recently visited Kocher's clinic, and who told me that that great surgeon was now using general anesthesia in many of these cases.

We have been told repeatedly by some of the German clinicians that Cesarean section must not be resorted to in cases in which instrumental intervention has been attempted, or in which repeated examinations have been made. This, I think, is also a grave mistake. During the time covered by Dr. Zinke's paper, since 1900, I have made five, or perhaps six, Cesarean sections without a maternal or fetal death. In one of these cases the woman had been in labor eight days; she had been examined by a half dozen physicians, and had a temperature of 101°, and pulse of 120. She made a perfect recovery. Another patient had been in labor 48 hours, with repeated examinations and repeated applications of forceps. She also made an ideal recovery. If the surgeon has clean hands, and cleans the abdomen thoroughly, I do not see why a woman should suffer from the abdominal section simply because she may have a little infection in the vagina, or even in the cervix.

I heartily approve of Dr. Zinke's paper. At the Cleveland meeting I stated that when we would see his paper in print I thought we would all of us agree with his conclusions. Such was the result, at least, in my own case.

In regard to Dr. Stamm's paper: I think it would be less dangerous to the patient for the surgeon to make a rapid Cesarean section in some of the cases described by him, than to do the work through the vagina. If we have a rigid cervix, a small vagina, and a rigid perineum, and, as a result, have a laceration extending into the uterine tissue, with laceration of the vagina and perineum, we will thus have much more traumatism than we would have with a rapid Cesarean section, and with, it seems to me, greatly increased danger of sepsis. In some of the other cases described by him, the vaginal operation would, of course, be clearly indicated.

DR. STAMM (closing the discussion on his part).—As to the remarks of the first speaker, I may not have expressed myself clearly in regard to the last case. The patient had no pains. The neck was only partially obliterated, the internal os was dilated, but the external os admitted barely two fingers, and no progress

was made from eight o'clock in the evening until six in the morning. As there was no further dilatation, I thought it was better to make an incision than to use forcible dilatation, because I have lost two patients by that method.

In regard to the remarks of Dr. Dorsett concerning placenta previa, I did not give any prominence to that subject, simply because the literature does not contain any cases yet, but Duhrssen in his theoretical deductions pointed out that indication first in 1895. There is no case on record, so far as I know, where vaginal Cesarean section was made in placenta previa, but he mentions it repeatedly, and says that it ought to be done, and that it is indicated in certain cases.

With reference to the remarks of Dr. Ricketts about administering veratrum to save the child, I have had no personal experience in regard to this drug. I have seen two patients die where this drug was given by others in puerperal convulsions. I remember twenty-five years ago Veit reported forty-four cases of puerperal convulsions in which he gave large doses of morphine and warm baths, and said no man ought to lose a case of puerperal convulsions, but still some die. Bumm, in one of his late articles on eclampsia, mentions that nearly every drug has been tried in cases of eclampsia with failure.

One of the speakers, Dr. Blume, I believe, said the name of vaginal Cesarean section is not the proper designation. If he makes that contention, then he has to take issue with Duhrssen. I leave it to better scholars than myself to decide whether it is proper or not.

The remarks of Dr. Baldwin that abdominal Cesarean section is less dangerous than vaginal Cesarean section are not borne out by the records. Hillman gives statistics where Cesarean section was performed for eclampsia, in 40 cases, with 21 deaths, and I must say that vaginal Cesarean section is more clearly indicated in puerperal eclampsia, before the normal term of pregnancy. We have not yet operated on forty cases of puerperal eclampsia by vaginal Cesarean section, but so far the mortality from the operation is low, and vaginal Cesarean section, while more difficult than abdominal Cesarean section, is evidently less dangerous.

In reference to the remarks of Dr. Porter, that it was not good surgery or good judgment on my part, after seeing a patient at eight o'clock in the evening to wait until the next morning before operating, I have to say that the patient was in the country. Having had an experience with two cases of puerperal eclampsia before the normal term, in which forcible dilatation was used, but no incision made, and having lost both cases, I did not wish to disturb the woman too much, nor did I wish to operate on her in the country by lamplight, but preferred to wait a few hours when I could operate at the hospital and I think the result has certainly been more satisfactory than if I had resorted to forcible dilatation a few hours earlier.

DR. ZINKE (closing the discussion).—When I read my paper

on Cesarean section for placenta previa two years ago, I returned from the meeting of the association a surprised and disappointed man, because of the adverse criticism it received. And ever since then I have been subjected to all sorts of criticism mostly unfair, often unjust and occasionally unkind. I have frequently maintained that he who does not agree with me on what I then said did not listen attentively when the paper was presented, or did not read it carefully when it was published, or again, failed to understand clearly the point in that article. There is nothing in the history of Cesarean section or any other operation that equals the results obtained in the six cases reported respectively by Bernays, Tait, Donoghue, Hare, Covington and Gillette. Some of these cases showed the beginning of sepsis and some had lost blood sufficient to cause a state of exhaustion and yet recovery took place. Every one of these operators deserves great credit for the courage each displayed in performing the operation, and we all have reasons for congratulation because of the success obtained.

I have been disappointed to-day because of the favorable reception my paper has received. I came well prepared to meet opposing argument; but there is no need for it. I myself have not had an opportunity to perform Cesarean section for placenta previa, but I should not hesitate a moment were I to meet with the condition calling for the operation. It is very important and necessary to educate the profession at large, that a woman afflicted with placenta previa (centralis or partial) should at once be sent to a hospital, properly tamponed. It is in a hospital only where the cases can be treated with safety. It is not every case of placenta previa centralis even that needs Cesarean section. The majority usually get along without it. There never was any question about it.

With reference to the criticism of Dr. Carstens in regard to my chart giving exact measurements in cases of pelvic contraction, I think it is better to be definite than indefinite, and leave the rest to the judgment of the reader. I do not confine anybody to those measurements. Every obstetrician must use his own judgment as to whether it is necessary or not to resort to Cesarean section.

That the septic cases, to which Dr. Baldwin referred, should not be subjected to Cesarean section, I agree with him perfectly. I think even some of these cases might be saved. I remember the first symphyseotomy I made, the first one west of the Alleghenv Mountains. The patient had marked symptoms of sepsis due to sloughing of the cervix. Both mother and child were saved. I thank you for the discussion.

THE GILLIAM OPERATION: A CLINICAL CONTRIBUTION.

By EDWARD J. ILL, M.D.,
NEWARK.

THE presentation of this clinical contribution to the knowledge of correcting retrodisplacements of the uterus is desirable for a twofold reason. First, to support and to carry the knowledge of a really valuable and safe operative procedure. Secondly, to do honor to its originator, a valuable member of this association.

The writer is not very apt to run in ruts and endeavors to carefully avoid extreme opinions. He was, therefore, slow in accepting Dr. Gilliam's operation, but as time has gone on he has become much gratified with the results, and has had fewer patients return with relapses than from any other applied operation.

Since Dr. Gilliam suggested this operation to us three years ago, the writer has performed one hundred and twenty-six operations for the correction of retrouterine displacements. Of these, eighty-six are recorded as having been done by the Gilliam method, twenty were Adams-Alexander operations, sixteen were ventral fixations, three vaginal fixations, and one the Mann operation. In other words, over 68 per cent. were done after the Gilliam method. There were no deaths. This number does not represent all his experience, for his assistants have probably done a like number which are not recorded in this paper. At first this operation was done only in those cases complicated by tubo-ovarian diseases or by traumatic injuries. As the results were watched and appreciated it was extended to the uncomplicated cases or ones where complication necessitated a dilation of the cervix and curettage of the endometrium. Of such cases there have been thirty. In looking over the records one can distinctly see how the operation as it grows in favor gradually becomes more frequent in the uncomplicated cases.

Many of the cases were examined again and again and the correct position of the uterus noted. No one procedure, however,

will give us absolute results, nor do we look for such infallible measures.

Within a month these patients have all been written to, and either a personal or a written report was received in sixty-one cases. Fifty-one reported themselves as entirely well, six as markedly improved, and four as no better. Among all these, five are pregnant and two have given birth normally. It will be interesting to consider the cases reported as no better. One case had extensive tubal inflammation with many adhesions, for which a resection of the tubes was done, the uterus remaining in the normal position. She was always a weakly woman.

The second case is not relieved, though the uterus is in normal position. The uterus and ovaries are both sensitive to touch.

The third case left the hospital in excellent condition free from all pain. She soon became melancholy and remains so to the present time. This woman had puerperal mania after the birth of her second child. It seems hardly fair to the operation to class this case as no better. I speak of it to complete my report.

These cases are failures only because the patients were not relieved of their symptoms. The following case is the only failure recorded in reference to a relapse and is especially interesting because the very intelligent patient submitted herself to a second abdominal section to ascertain the cause of the failure and to correct, if possible, the deformity.

Miss E. B., a teacher, presented herself in the autumn of 1901 with a retroflexed uterus which made standing a torture. Dysmenorrhea prevented her from following her occupation for two days in a month. After all sorts of endeavors to relieve her had failed, she desired an operation, which was done on February 4, 1902. The cervix was dilated, the uterus curetted, and a Gilliam operation performed. She promptly recovered, and in six weeks was back at schoool. She remained well for about ten months, when she began to have a recurrence of backache increased by standing. An examination made in April of this year showed the uterus in retroflexion and freely movable. The menstrual pain had not returned. Postural treatment and pessaries failed to correct the malposition.

A second operation was done on June 22 of this year. On opening the abdomen it was found that the uterus was freely movable, there being no adhesions anywhere except a slight omental agglutination at the peritoneal scar. On lifting the uterus and round ligaments into view, it was noticed that that part of the round

NO.	DATE	NAME	AGE	M. OR S.	NO. CHILDREN	DIAGNOSIS	OPERATIONS	IMMEDIATE RESULTS	REMARKS
1	Oct. 8, 1900	C, H.	27	M	1 miscarriage	Retroflexed uterus; adherent uterus	Dilatation of cervix; curettage; Gilliam operation; separation of adhesions	Good	September 5, 1903. Is very well; is now pregnant
2	Oct. 11, 1900	E. P.	42	M	1	Hyperplastic endometritis; laceration of cervix and perineum; retroflexed adherent uterus	Curettage; amputation of cervix; perineorrhaphy; separation of adhesions; Gilliam operation	Good	
3	Nov. 30, 1900	C. C.	28	M	None	Retroflexed uterus	Gilliam operation	Good	
4	Dec. 7, 1900	A. O.	34	S		Retroflexed uterus	Gilliam operation	Good	September 5, 1903. Is very well
5	Dec. 8, 1900	B. H.	32	M	2 abortions	Retroflexed uterus; adherent left ovary	Curettage; Gilliam operation	Good	December 14, 1901. Had a baby, born normally
6	Dec. 21, 1900	N. H.	36	M	1	Hyperplastic endometritis; laceration of perineum; retroflexed uterus	Curettage; perineorrhaphy; Gilliam operation	Good	
7	Jan. 26, 1901	R. E.	49	M	1 miscarriage 3 children	Laceration of perineum; prolapse of uterus	Perineorrhaphy: Gilliam operation	Good	
8	Feb. 2, 1901	R. L.	30	M	None	Hyperplastic endometritis; retroposition and version; ectropium of the cervix	Curettage; amputation of cervix; Gilliam operation	Good	September 4, 1903. Is very well
9	Feb. 28, 1901	M. U.	35	S		Retroflexed uterus; hyperplastic endometritis	Dilatation of cervix; curettage; Gilliam operation	Good	December, 1902. Is very well
10	Mar. 16, 1901	H. N.	38	M		Laceration of cervix and perineum; retroverted uterus	Curettage; amputation of cervix; trachelorrhaphy; Gilliam operation	Good	Is very well at the present date
11	April 11, 1901	K. H.	27	M	1	Hyperplastic endometritis; laceration of cervix; retroflexed uterus	Curettage; amputation of cervix; Gilliam operation	Good	
12	May 2, 1901	P.	30	M		Laceration of cervix and perineum; retroflexed uterus	Curettage; amputation; trachelorrhaphy; Gilliam operation	Good	Very well

13	May 13, 1901	M. F.	30	S		Retroflexed uterus; prolapsed ovary; hyperplastic endometritis	Curettage; Gilliam operation	Good	
14	June 14, 1901	B.	25	M	1	Hyperplastic endometritis; retroflexed uterus	Curettage; Gilliam operation	Good	An Adams-Alexander operation failed because of very thin ligaments; when the abdomen was opened the ligaments were found very attenuated; still a Gilliam operation was performed
15	Sept. 21, 1901	M. C.	33	M	1 miscarriage 4 children	Retroflexed adherent uterus; cystic ovaries	Punctured cyst of left ovary; excised portion of right ovary; Gilliam operation	Good	December 13, 1902. Is very well
16	Sept. 24, 1901	A. S.	44	M	3	Hyperplastic endometritis; retroflexed adherent uterus	Curettage; Gilliam operation	Good	September 5, 1903. Is perfectly well
17	Sept. 28, 1901	E. B.	32	M	3 miscarriages; 1 child	Laceration of cervix; retroflexed adherent uterus	Amputation of cervix; Gilliam operation	Good	September 5, 1903. Is not well, having contracted an inflammation of the bladder some time after operation and after dismissal; is pregnant since the end of December, 1902; this is the first pregnancy she is carrying to the end since the first child; she is well of her old symptoms
18	Oct. 4, 1901	S. A.	30	S		Retroflexed uterus; fibromyomata	Myomectomy; Gilliam operation	Good	September, 1903. Is well
19	Oct. 19, 1901	S. R.	36	M	1	Laceration of cervix and perineum; retroflexed uterus	Amputation of the cervix; perineorrhaphy; Gilliam operation	Good	
20	Oct. 22, 1901	C. S.	24	S		Retroflexed and retroposed uterus	Curettage; stretched utero-sacral ligament; Gilliam operation	Good	January, 1903. Very good
21	Nov. 4, 1901	J. F.	25	S		Hyperplastic endometritis; retroflexed uterus	Dilatation of cervix; curettage; Gilliam operation	Good	December 24, 1902. Perfect health
22	Nov. 7, 1901	A. W.	37	M	3	Laceration of cervix and perineum; retroflexed uterus	Trachelorrhaphy; perineorrhaphy; Gilliam operation	Good	June, 1903. Is very well

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23	Nov. 7, 1901	D. C.	26	S		Retroflexed uterus; dermoid fistula of coccyx	Gilliam operation; removal of coccygeal fistula	Good	
24	Nov. 19, 1901	D. W.	19	M		Hyperplastic endometritis; retroflexed adherent uterus, tubes and ovaries; double pyosalpinx	Curettage; ablation of tubes; Gilliam operation	Good	December 5, 1902. Well
25	Nov. 23, 1901	K. O.	25	S	None	Retroposition and retroversion, with adhesions	Shortening of utero-sacral ligaments; Gilliam operation	Good	
26	Dec. 3, 1901	E. D.	28	M	?	Retroverted uterus	Gilliam operation	Good	September 5, 1903. Is well from symptoms operated on, and gave birth to a child January, 1903; has some trouble with urine (written communication)
27	Dec. 21, 1901	M. S.	22	S		Retroverted uterus; stricture of os internum; hyperplastic endometritis	Dilatation of cervix; curettage; Gilliam operation	Good	
28	Jan. 4, 1902	G. B. S.	34	S		Stricture of os internum; retroflexed uterus: hematoma of both ovaries	Dilatation of the cervix; Gilliam operation; exsection of hematoma	Good	May, 1903. Is very well
29	Feb. 4, 1902	E. B.	28	S		Stricture of os internum; retroflexed uterus	Dilatation of cervix; curettage; Gilliam operation	Good	June 22, 1903. Bag operated on again for relapse; see Case No. 84
30	Feb. 5, 1902	E. B.	36	M	1	Retroflexed adherent uterus, tubes and ovaries; hyperplastic endometritis	Dilatation of cervix; curettage; separation of adhesions; ablation of tubes; resection of portion of ovary; Gilliam operation	Good	December 12, 1902. Is well
31	Feb. 8, 1902	C. H.	26	M	1	Retroflexed adherent uterus	Resection of tubes only; separation of adhesions; Gilliam operation	Good	September 8, 1903. The uterus is in good position, freely movable, yet she is no better; always was a weakly woman

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32	Feb. 18, 1902	R. L.	22	S		Elongation of the cervix; retroflexed uterus	Curettage; amputation of cervix; Gilliam operation	Good	Well
33	March 1, 1902	R. McG.	33	M	1 miscarriage 6 children	Laceration of cervix and perineum; prolapse of uterus	Amputation of cervix; anterior and posterior colporrhaphy; perineorrhaphy; Gilliam operation	Good	September 5, 1903. Is perfectly well
34	March 8, 1902	A. N.	27	M	None	Salpingo-oovaritis; chronic retroflexed uterus	Resection of tubes only; separation of adhesions; Gilliam operation	Good	
35	March 11, 1902	A. A.	36	M	3	Laceration of cervix and perineum; retroflexed adherent uterus	Curettage; amputation of cervix; separation of adhesions; Gilliam operation	Good	April, 1903. Is in fair health; uterus is in perfect antiposition and freely movable
36	March 13, 1902	E. S.	24	M	1	Retroflexed adherent tubes and ovaries; femoral hernia	Curettage; separation of adhesions; Gilliam operation; herniotomy	Good	September 5, 1903. Is much improved except for pain in left iliac
37	Mar. 15, 1902	D. T.	23	M	1 miscarriage 1 child	Complete perineal laceration of cervix; retroflexed uterus; hyperplastic endometritis	Curettage; perineorrhaphy; Gilliam operation	Good	
38	Apr. 23, 1902	S. S.	33	M	1	Laceration of cervix and perineum; retroflexed adherent uterus, tubes and ovaries; chronic appendicitis	Trachelorrhaphy; perineorrhaphy; appendectomy; Gilliam operation	Good	May, 1903. Is in excellent health; uterus in normal position
39	May 1, 1902	M. Y.	34	M	3	Retroverted uterus	Gilliam operation	Good	
40	May 9, 1902	C. R.	23	M	None	Retroflexed uterus; adherent tubes and ovaries; hyperplastic endometritis	Curettage; separation of adhesions; Gilliam operation	Good	August 28, 1903. Is now pregnant for the first time after many operations for sterility
41	May 20, 1902	D. M. A.	24	S		Retroflexed uterus	Gilliam operation	Good	June, 1903. Not relieved, though uterus is in normal position; uterus and ovaries are very sensitive
42	June 20, 1902	N. R.	33	S		Retroverted uterus. Prolapsed ovary	Gilliam operation; resection of cyst of ovary	Good	September 4, 1903. Is very well; has a slight pain in left iliac
43	June 27, 1902	K. B.	24	S		Hyperplastic endometritis. Retroflexed uterus	Dilatation of cervix; curettage; Gilliam operation	Good	September 8, 1903. Is well

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44	Sept. 10, 1902	D. K.	27	M	None	Stricture of os internum; hyperplastic endometritis; retroflexed uterus	Dilatation of cervix; curettage; Gilliam operation	Good	September 8, 1903. Is very well
45	Oct. 1, 1902	C. G. K.	46	M	5	Retroflexed uterus	Gilliam operation	Good	June, 1903. Is very well
46	Oct. 7, 1902	T. Y.	32	M	4	Retroflexed uterus	Gilliam operation	Good	September 5, 1903. Is much improved, except for increased menstrual flow and some iliac pain; uterus normal position
47	Oct. 10, 1902	L. H.	36	M	?	Retroflexed uterus	Gilliam operation	Good	June, 1903. Is very well
48	Oct. 10, 1902	I. Price	36	M	?	Laceration of perineum. Retroflexed uterus; chronic appendicitis	Perineorrhaphy; appendectomy: Gilliam operation	Good	September 5, 1903. Is very well
49	Nov. 4, 1902	E. H.	32	M	4	Laceration of cervix and perineum; retroflexed uterus	Trachelorrhaphy; perineorrhaphy; Gilliam operation	Good	
50	Nov. 5, 1902	L. D. S.	33	M	2	Retroflexed uterus	Gilliam operation	Good	
51	Nov. 8, 1902	E. Y.	38	M	4 children; 1 miscarriage	Laceration of perineum; retroflexed uterus	Perineorrhaphy; Gilliam operation	Good	
52	Nov. 8, 1902	A. C. B.	39	M	3	Hyperplastic endometritis: laceration of perineum; retroflexed uterus; prolapse of anterior walls of vagina	Curettage; perineorrhaphy; anterior colporrhaphy; Gilliam operation	Good	September 4, 1903. Is better; slightly nervous
53	Nov. 22, 1902	M. Y.	35	M	1	Laceration of cervix and perineum; retroflexed uterus; prolapse of uterus	Curettage; amputation of cervix; perineorrhaphy; Gilliam operation	Good	September 4, 1903. Is very well; condition excellent (some pain in perineum)
54	Nov. 25, 1902	A. H.	32	M	5	Retroflexed uterus	Gilliam operation	Good	September 5, 1903. Pregnant two months; is very well
55	Dec. 5, 1902	S. V.	28	S		Retroflexed adherent tubes and ovaries; tubal gestation; R. side	Curettage; ablation of R. tube; Gilliam operation	Good	

56	Dec. 16, 1902	E. J. H.	41	M	1	Laceration of cervix and perineum; retroflexed adherent uterus, tubes and ovaries	Curettage; trachelorrhaphy; perineorrhaphy; Gilliam operation	Good	August 1, 1903. Very well
57	Jan. 9, 1903	L. H.	29	M	1	Retroverted uterus	Gilliam operation	Good	
58	Jan. 17, 1903	L. M.	24	M	2	Laceration of cervix and perineum; retroflexed uterus	Curettage; trachelorrhaphy; perineorrhaphy; Gilliam operation	Good	
59	Jan. 20, 1903	H.	39	M	None ?	Hyperplastic endometritis; retroflexed adherent uterus, tubes and ovaries; hematoma of both ovaries	Curettage; exsection of hematoma: Gilliam operation	Good	
60	Jan. 24, 1903	A. C. M.	42	M	5	Laceration of cervix and perineum; retroflexed uterus; chronic appendicitis; fibromyomata	Trachelorrhaphy; perineorrhaphy; myomectomy; Gilliam operation; appendectomy	Good	September 5, 1903. Is very well; except when under great exertion has a backache
61	June 30, 1903	M. F.	29	M	None	Retroflexed uterus; hyperplastic endometritis	Curettage; Gilliam operation	Good	September 5, 1903 Is very well; no menstrual pain; ph. ex. shows normal conditions
62	Jan. 31, 1903	A. P.	25	M	1	Laceration of cervix; retroflexed uterus	Curettage; trachelorrhaphy; Gilliam operation	Good	September 3, 1903. Uterus is in normal position: still some backache
63	Feb. 6, 1903	A. N.	46	M	6 miscarriages; 10 children	Laceration of cervix and perineum; prolapse of uterus	Curettage; amputation of cervix; perineorrhaphy; Gilliam operation	Good	
64	Feb. 10, 1903	T.	42	M	1	Hyperplastic endometritis; laceration of perineum: retroflexed uterus	Curettage; perineorrhaphy; Gilliam operation	Good	September 4, 1903. Result very good; uterus still a little large
65	March 1, 1903	J.	24	M	1	Laceration of cervix; retroflexed and retroposed uterus	Curettage; amputation of cervix; Gilliam operation	Good	September 5, 1903. Has been thoroughly well and is pregnant since three months (one child 3½ years old)
66	March 7, 1903	A. M.	39	M	3	Laceration of cervix and perineum; retroflexed uterus	Curettage; trachelorrhaphy; perineorrhaphy; Gilliam operation	Good	Irregular flow: no backache or bearing down; ph. ex. shows fissure in ano; uterus in normal position
67	March 11, 1903	K.	47	M	?	Retroflexed uterus; double hydrosalpinx	Curettage; ablation of tubes; Gilliam operation	Good	September 5. Is perfectly well; menstruates normally

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68	April 4, 1903	L. M.	28	S		Stricture of os internum; hyperplastic endometritis; retroflexed adherent uterus	Dilatation of cervix; curettage; Gilliam operation	Good	September 3. Is very well
69	April 12, 1903	C. S.	39	M	?	Laceration of perineum; retroflexed uterus	Curettage; perineorrhaphy; Gilliam operation	Good	June, 1903. Is very well
70	April 19, 1903	T.	36	M	3	Hyperplastic endometritis; retroflexed adherent uterus, tubes and ovaries	Curettage; amputation of cervix; resection of tubes only; separation of adhesions; Gilliam operation	Good	September 3. Is very well
71	April 22, 1903	A. W.	33	M	?	Double pyosalpinx; retroflexed uterus	Ablation of tubes; removal of left ovary; Gilliam operation	Good	September 8. Is very well
72	May 5, 1903	M. G.	32	M	?	Retroflexed uterus; prolapsed ovary	Gilliam operation	Good	
73	May 16, 1903	C. D.	23	M	2	Hyperplastic endometritis; laceration of perineum; retroflexed uterus	Curettage; perineorrhaphy; Gilliam operation	Good	September 5, 1903. Left hospital in excellent condition; soon became melancholy and remained so to the present time; was melancholy after birth of second child
74	May 26, 1903	M. H.	30	M	1	Laceration of cervix and perineum; retroflexed uterus	Curettage; amputation of cervix; perineorrhaphy; Gilliam operation	Good	September 3, 1903. Is very much improved; has slight backache and pain in left iliac since two weeks; sudden cessation of menses two weeks ago
75	May 28, 1903	B.	30	M	2	Laceration of cervix and perineum; retroflexed uterus	Curettage; trachelorrhaphy; perineorrhaphy; Gilliam operation	Good	
76	May 29, 1903	C. N.	40	M	5	Laceration of cervix and perineum; retroverted uterus	Curettage; amputation of cervix; perineorrhaphy; Gilliam operation	Good	August, 1903. Very good condition

77	June 1, 1903	S. T.	37	M	2	Hyperplastic endometritis; laceration of cervix; retroflexed uterus	Curettage; trachelorrhaphy; resection of portion of ovary; Gilliam operation	Good	September 5, 1903. Is well with exception of some menstrual pain; uterus is in normal position
78	June 2, 1903	A.	28	S		Stricture of os internum; hyperplastic endometritis; retroflexed uterus	Dilatation of the cervix; curettage; Gilliam operation	Good	September 8, 1903. Good; says "she is a new woman"
79	June 7, 1903	S. W.	29	M	1	Hyperplastic endometritis; laceration of cervix; retroflexed uterus; simple cyst of ovary	Curettage; amputation of cervix; resection of portion of ovary; Gilliam operation	Good	September 3, 1903. Is much improved; still has slight backache and some leucorrhea
80	June 13, 1903	H. B.	31	M	1	Laceration of cervix and perineum; retroflexed uterus	Curettage; amputation of cervix; perineorrhaphy; Gilliam operation	Good	September 3, 1903. Is much improved; ph. ex. shows organs in perfect condition
81	June 15, 1903	L.	31	S		Stricture of os internum; retroflexed uterus	Dilatation of cervix; curettage; Gilliam operation	Good	February 8, 1903. Now well; four years ago had a Mathew D. Mann operation; the ligaments stretched out and became much atrophied
82	June 16, 1903	S.	23	S		Stricture of os internum; retroflexed uterus	Dilatation of the cervix; curettage; Gilliam operation	Good	September 5, 1903. Is much improved
83	June 20, 1903	M. M.	31	S		Stricture of os internum; retroflexed uterus; chronic appendicitis	Dilatation of the cervix; curettage; appendectomy; Gilliam operation	Good	September 3. Normal conditions
84	June 22, 1903	E. B.	30	S		Retroflexed uterus	Gilliam operation and suspension by two chromicized catgut sutures	Good	February 4, 1902. This is the case that failed
85	June 26, 1903	A. D. S.	23	S		Stricture of os internum; hyperplastic endometritis; retroflexed adherent uterus; hematoma of left ovary	Dilatation of cervix; curettage; separation of adhesions; Gilliam operation; exsection of hematoma	Good	September 8, 1903. Good
86	June 30, 1903	M. J.	32	M	3	Retroflexed adherent uterus, tubes and ovaries	Curettage; separation of adhesions; Gilliam operation	Good	

ligament beyond the suture was atrophied, while the near end had remained in its normal thickness. The writer thinks it probable that the suture was drawn too tight, strangulating the central artery. Whether this explains the separation of the adhesion is a matter of uncertainty. The stump of the ligament was again fastened after a modified Gilliam operation. To give additional security, two chromicized sutures were placed just above the os internum and fastened to the anterior abdominal peritoneum.

Thus, this case teaches one thing, that an atrophy of the distal end of the ligament may take place. Whether the writer's explanation is correct is a matter of future observation. The artery supplying the round ligament runs in the direction from the uterus outward, and when it becomes obliterated by suture we have one explanation for some of the failures of the intra-abdominal shortening of the round ligament.

When Dr. Gilliam first suggested his operation, the writer was averse to piercing the whole abdominal wall, fearing a weakness from which a hernia might result. He therefore modified the operation by separating the rectus abdominis from its anterior sheath and then repiercing the rectus muscle, the inner sheath of the rectus and the peritoneum. The ligament is thereafter drawn out as Dr. Gilliam taught us, but fastened to the posterior surface of the anterior sheath of the rectus with chromicized catgut, thus leaving the strong fascia intact.

The writer takes no special credit for this modification, and the operation is always described as a Gilliam ventral suspension in his records. He thinks, however, that there is an advantage in not piercing the anterior sheath of the rectus. The writer wants to thank the originator for a very valuable addition to our means for the correction of a retrodisplacement of the uterus.

A glance at the tables will tell what a variety of complications were met during the performance of this operation.

DISCUSSION.

DR. HERMAN E. HAYD, Buffalo.—The paper of Dr. Ill is very interesting because it brings up the subject of whether it is necessary to open the peritoneal cavity for uncomplicated retroversion. I have no objection to the Gilliam operation. I have never done it. If we have a complicated condition of affairs, with an adherent, retroverted uterus, with diseased tubes and ovaries, etc., then I assent, and would advise to open the peritoneal cavity and shorten the round ligaments by Dudley's method, Mann's

method, or any of the other methods. But I cannot see the object of inviting dangers which are associated with opening the peritoneal cavity. It is not a question of mortality alone, but one of future complications; as the result of incision into the abdominal cavity, adhesions take place. You may get an adhesive inflammation of the bowel to the parietal wall, and, as a result, future complications requiring very radical, even mortal operations. In my own experience, three times I have been compelled to reopen the abdominal cavity for obstruction of the bowels, after an operation in which I entered the peritoneal cavity and did a simple ventral suspension and some conservative work on the tubes and ovaries. Therefore, the criticism I have to make is the same as I have for the Goldspohn operation, and all other intra-abdominal procedures. We can do an Alexander operation, invariably find the round ligaments, succeed in putting the uterus in anteflexion, and in all probability as large a percentage of cases as the essayist has reported, will be cures. If the Alexander operation is done properly, there is no necessity for opening the peritoneal cavity in cases of uncomplicated retroversion; in fact, it is not then an Alexander operation.

DR. ALBERT GOLDSPOHN, Chicago.—I regard the Gilliam operation as the next best to the Alexander method; the latter mode of shortening the round ligaments being, in my judgment, the best of all such operations, provided, of course, when thoroughly done, all the indications can be met through the inguinal canal. No operation, nor any number of operations, aside from inguinal shortening of the round ligaments, has such a column of cases collected that have stood what I call the double test of pregnancy as has the Alexander operation. Not an approach, not a small fraction even, have all the other procedures together of such valuable testimony in their favor. As to the ulterior results the procedure does not interfere with the expansion of the uterus in gestation, and there is also no liability that there will be a recurrence of displacement of the uterus after any number of parturitions. I have done the Gilliam operation on these principles, only in those cases where I regarded it necessary for other reasons, to open the abdomen by a regular ventral incision. This is natural for one who is convinced of the superior value of inguinal shortening of the round ligaments to the extent that I am, and who is becoming more and more so convinced. He will try to give as many of the complicated cases of retroversion the superior benefits of the Alexander route—*i.e.*, a permanent cure, and not simply an operative procedure which promises to help them only until the next baby comes. I am referring now to those complicated cases of retroversion, with adhesions, with cystic or degenerated ovaries, with perhaps diseased appendages on one side requiring extirpation. These can have the superior benefits of the bi-inguinal operation. I do not apply this criticism to the Gilliam operation, however; I am willing to wait for its results. I am glad Dr. Ill has some of them to contribute.

The determining question with regard to the Gilliam operation is this: will the round ligaments, after labor, undergo involution, as they are thoroughly known to do after thorough inguinal shortening, and will they continue to hold the uterus from going back into retroversion or descensus? That they will do this, is by no means certain, because in inguinal shortening the proposition is, that the ligaments simply act as a balancing power, but the weight of the uterus is not suspended upon the ligaments. In round ligament suspension, however, the weight of the uterus hangs upon the ligaments, and whether they will, as a rule, undergo involution and succeed in carrying the uterus normally, remains to be seen. I am very anxious that the gentlemen who have labor cases after the Gilliam operation shall very carefully examine them. We should not be content with the patients' statement that they feel all right. A woman may feel all right, yet have a retroversion of the uterus, or she may not feel any better, and still have no retroversion. We must have both the subjective condition and objective examination in every case, as testimony. In the two cases of labor Dr. Ill has had, I wish he would tell us what he knows in regard to the position of the uterus, and if this was ascertained by actual examination after labor or several months later.

The old superficial Alexander operation, which shies at opening the peritoneum and *pretends* not to do this, is of very little value, and in only a small number of cases, such as might be treated by pessaries. If we make hernial wounds and have them heal always by primary intention, then we are certainly clean enough to do work in the peritoneal cavity. It is a safer test of an operator's cleanliness to have primary union in his hernia work, than to have things go smoothly in ordinary laparatomies. The cases of intestinal obstruction mentioned by Dr. Hayd are purely accidental, and would hardly occur when such simple intraperitoneal work is done upon the appendages, as in these cases. Very many of these cases have also some elongation of the sacro-uterine ligaments. If the shortening of the round ligaments is not very thorough then, so that the round ligaments are given the superior advantage of pulling directly forward from the body of the uterus, but pull at a great disadvantage some distance away from it, from points of remaining entanglement in the broad ligaments, it is easy to see, from a simple study of the mechanism, that there will be great danger of return of retroversion, and these cases of simple Alexander operations have been frequently followed by a recurrence of displacement even without the test of subsequent labor, and have become a laughing stock with some men, particularly in Philadelphia.

Another point: if, without intelligent inspection through a small opening in the peritoneum, you shorten the round ligament thoroughly enough to prevent retroversion, you will frequently draw the broad ligament, where the tube is attached, so much into the abdominal wall as to kink the Fallopian tube, as I demon-

strated yesterday to a number of gentlemen. There is no reason under the sun, when we have such perfection in surgical cleanliness, and do not hesitate to open the peritoneal cavity for other conditions, why we should not do it in these cases.

DR. D. TOD GILLIAM, Columbus.—I am sorry to say that I cannot add anything to what Dr. Ill has said, and I cannot say it as well as he has done. Both Dr. Ill and Dr. Goldspohn have elucidated the subject much better than I can myself. What Dr. Ill has said in regard to the number of cases he has reported and the results of pregnancy, has been gratifying to me, as it must be to any one who has adopted this operation. I am receiving reports from medical men all over the country with reference to pregnancy following this operation and, with one or two exceptions, the women have passed through pregnancy without any more trouble than they would experience under ordinary circumstances. I have a number of cases myself in which pregnancy has occurred; I have watched the results, and the patients have gone through the ordeal of pregnancy and labor without any trouble. I have examined quite a large number of cases after pregnancy, and I have found that the uterus remains in place. I have had occasion to open the abdominal cavity once, for the relief of some local trouble, one or two years after doing this operation, and observed that the round ligaments were just as firm and large on the uterine side as they were before the operation. The uterus was likewise held in place. When we consider the circulation of the round ligaments, we will understand why it should be.

I would like to correct Dr. Goldspohn on one point: he speaks of suspension of the uterus from the round ligament by my operation. As I do the operation, there is really no suspension. I take the ligament out some distance from the uterine horn, so that the uterus is not suspended, but lies upon the bladder. Some who are doing the operation take the ligament up too close to the uterine horn. I have had one case in which there was trouble at labor, in which the ligament was thus taken up. In my first cases, taking Ferguson's method as the basis of my operation, I took it up close to the uterine horn and had serious trouble at labor. After that, I went out an inch and a half, sometimes two inches, from the uterine horn, and let the uterus lie upon the bladder. It then has all the motions it would have under normal relations. But it cannot get beyond the vertical line.

With regard to operating on uncomplicated cases, I have been governed very much as Dr. Ill has. I started to use the operation only in complicated cases, but as I witnessed the results and saw how nicely everything seemed to be afterward, I began to apply it to cases of all kinds, and in every case of retroversion that came to me I would use this method. I have never had occasion to regret it. The women have no feeling of distress of tension, and are benefited by the correction.

As to the complications or sequelæ spoken of by Dr. Hayd, I

have no special fear of them. After a given time, following any form of abdominal section, adhesions may form, and sometimes evil results follow, but these have never occurred in my practice and consequently I have no fear from that source. Once in a while you will find a case in which the round ligament is short, and you know how these ligaments will allow the uterus to flop over when the ligament is not long. In a case of that kind. I have found tension on the ligament, but it is transitory. A case occurred six weeks ago, in which I operated on the ligament and feared the woman would have great distress afterward, but she did not complain after the first week. It accommodates itself to the conditions.

DR. ILL (closing the discussion).—With reference to the question of Dr. Goldspohn as to the condition of the uterus after pregnancy in the two cases which gave birth to children, I can only say that the uterus has remained in its proper position. I have not had a chance to examine these patients during pregnancy, and I do not know what the condition of the round ligaments was during that time.

ANALYSIS OF COMMON CAUSES OF DEATH FOLLOWING PELVIC AND ABDOMINAL OPERATIONS.

By JOSEPH PRICE, M.D.,
PHILADELPHIA.

I HAVE selected this subject, not because I have had a high mortality, but for the reason that it is one of great interest to us all. It is the exception that I witness a death in my own work, and I am not prompted to write this paper because I am interested in post-mortem examinations; I never see them; but for the reason that I hear and read, in the great medical and lay press, of deaths which I think should not occur. My friends and acquaintances detail deaths and experiences in abdominal surgery, and ask me how they could have avoided the numerous accidents and deaths? They tell me that they think they can do better work the next time.

Just a year ago, after a heated discussion on drainage, I received a letter from a good friend who witnessed, on his way home from our last meeting, a section in a greatly emaciated patient, for an old suppuration, with extensive adhesions and bowel lesions. The operation was finished, an open treatment, and shortly after his return home he writes me as follows: "Since my visit with you I have done six successful, but desperate, cases with the open treatment. I really believe they would have all died had I not left in a great duct and packing." This is an expression from a good surgeon with long and varied experience, both in his own hands and in observation of the work of others. You often hear good men say "nothing succeeds like success," and I believe it stimulates many to do painstaking work. It is well that operators should have over them what the boy gives the top—the lash. The dread of a death, the criticisms or comment of colleagues or hospital directors should not stay his hand in the wise choice of material and the completion of operations that should not be abandoned, nor incompleted.

A prominent young operator remarked to his assistant "that they had had too many deaths; that the Directors were talking;" and finished his operation as exploratory in character.

Mr. Tait in his first series of one thousand sections had one hundred exploratory incisions, that is, one in ten; if we could exclude so large a percentage, by an accurate diagnosis, our mortality should be *nil.* Now, that we have hospitals in nearly every small village, we have a higher mortality than we ever had in the history of the speciality of abdominal surgery. The local surgeon, in thousands of instances, without more than an object lesson or two at a distance in a post-graduate school, attempts a great variety of operations in the peritoneal cavity, and explains the disaster of his patient's death as due to the hopeless conditions and complications found within the abdominal or pelvic cavity. All of these conditions and procedures would have been perfectly simple to a well-trained man. Unfortunately the lay directors and managers of hospitals have every confidence in the newly appointed surgeon-in-chief to their hospital, and yet the only knowledge they have of his surgical work is the amputation of Pat Maloney's leg some years in the past. They place their wives and daughters in the Templars, Odd Fellows or Red Mens' private room, or that furnished by the Presbyterian or Episcopal Church, or that endowed by $300 in perpetuity in memory of Mrs. Brown; and she dies on the third day, "Because the conditions were *simple* but hopeless."

I have written several papers on post-operative complications and several upon repeated operations in incomplete abdominal procedures. This is the class of cases that perplex me more and more as I grow older and give me the only mortality I meet with nowadays. Only recently I have had a number of trying and sad experiences.

In one case, a patient came from a prominent hospital after a very simple but incomplete operation, where the operator had only partially removed one pathological ovary and tube, leaving the organs on the other side in a badly diseased state. She was sent to me some four months following this incomplete procedure, emaciated, septic and suffering acutely. I opened the abdomen and found a strongly adherent bowel and omentum. The consolidation of everything made me strongly suspicious of what I would find below. The viscera freed, I found a huge four-foot gauze towel anterior to the uterus, the towel and pus pushing the uterus well back; the stench contaminated the hospital in a few

seconds. This patient lived but a few hours, her death being the only one in the hospital in a long series, greatly distressing the operator, nurses and all concerned. Unfortunately, the spectators were numerous, many being on their way home from the Congress in Washington. Most of them went directly from my clinic to that of Dr. John Deaver where was witnessed precisely the same accident, Deaver's patient coming from a neighboring hospital for relief. I was sorry to have visitors see operations done to correct surgery and accidents which should never have occurred, careless and unjustifiable accidents.

Post-operative sequelæ and deaths from gauze are very common, I am satisfied, thrice more common than ever from sponges. For a number of years I used sponges and valued them for clean work, for packing or for a dry operation, and I believe viscera troubled me less than at the present time. I was then wholly ignorant of post-operative sepsis in my own work, and in that of my pupils. Had I now the time to take care of my sponges, I would go back to them, as highly as I value gauze. To my mind, it is one of the most valuable materials in our surgery. We have given the speciality of nursing more attention as we advance in our work, and I am satisfied we all feel abundantly rewarded by a low mortality for the interest we have taken in that speciality. My nurses keep my mortality down. It is a speciality which we should pay even more attention to. Many nurses are receiving better education than we did, and are capable of great good as well as some evil. If immoral, they are dangerous; as lobbyists they are dangerous. Chief nurses are wrecking some good hospitals by running the institution in the interest of one or two of the staff, to the disadvantage of the others. Five and twenty years ago they occupied a small space in the resident portion of the hospital, the chief nurse dining with the nurses, but now she commands the privileges of the steward at the residents' table, private apartments and a nurse's home very much finer than the original hospital.

A number of good operators attribute their low mortality wholly to gloves. One very scientific teacher asked me before putting on his gloves, if I did not think twelve to fifteen per cent. was a low mortality, taking cases as they come? I replied, "no, too high." After adopting the gloves, he reduced his death rate to about *nil*; but his precautions were all redoubled; for example, after operating on a septic case, other operations were postponed for thirty-six to forty-eight hours. Again, in a study of the

complications and pathology, in his reported cases, I failed to find one which could have died from good surgery. Let me illustrate how difficult it is for the general practitioner to make choice of an easy operation. Recently a very good diagnostician asked me to incise a suppurating kidney, as he felt it was one of the most difficult and dangerous operations in surgery. I did it for him, and it was simple play when compared with much of the work I am requested to do. After the operation he desired me to see a patient with advanced pelvic suppuration on both sides, puriform tubes and ovaries, with extensive adhesions. This case, he thought, was an easy one and desired to perform the section. He operated and she lived only sixteen hours; my patient made a speedy recovery.

I operate in a great many small hospitals throughout the country, and I strongly advise my pupils and friends not to undertake complicated and unpromising operations, but to allow the older and more prominent operators do them. I could clip from the daily papers the accounts of deaths, both early and remote, which should never have occurred. While glancing over this morning's paper, I saw the notice of a death—a young man, twenty-two years old, who "never fully recovered from the effects of an operation, in May last, for appendicitis, and for several days his condition was critical." Re-operation by one familiar with such procedures would probably have saved him; his appendix or possibly a sponge remained in his peritoneal cavity. The adherent omentum and bowel were never freed, the snarls forming an obstruction from the effects of which he could have died at any time, or a puddle of pus in his pelvis or posterior to the cecum remained undrained. For a long while we discussed the propriety of operative intervention in appendicitis; now, we are discussing how to do it well without a death, and we are all shocked at the numerous incomplete methods of operating which are responsible for a high death rate all over the country. Some operators tell us that their acute septic peritoneal cases all die; in these patients his operation, his toilet and his drainage are all at fault.

Recently a brilliant young surgeon assisted me in an operation for acute gangrenous and perforated appendicitis, with general septic peritonitis, the peritoneum charged and bathed in septic fluid. This case got a wash toilet and a coffer-dam drain; she never had a bad symptom. He remarked that about all these cases died in his hands. I see that in a splendidly appointed hospital, with which he is connected, the mortality is high in appendicitis

operations. My reasons for alluding so fully to this subject are because the disease is so common, and the death rate so high.

Some years ago I alluded in papers and discussions, to appendicitis simulating typhoid fever with perforation, and stated that a good number of cases of appendicitis were being treated for typhoid. Some good clinicians and diagnosticians ridiculed the idea, and I am now almost sorry I ever presented the subject, as it seems that surgeons are going to the other extreme. In mild and simple typhoid, they are opening the abdomen and removing the appendix with unfortunate sequelæ and a startling mortality. This reference is made purely to demonstrate a common cause for a high death rate in abdominal surgery.

Vaginal incisions and perforations favor a high mortality in later operations made for the clean removal of the remaining pelvic pathology. Purifom tubes and ovaries, suppurating tubes and ectopic pregnancy, seldom allow sufficient improvement in vital force and stamina to bear well the complete operation (suprapubic) after they have been incised through the vagina. Primarily, they would all have been easy by complete methods without mortality. The choice of method and material are of paramount importance to good work, and the suprapubic procedures, when complete and done early, drainage used when necessary, should like the infrapubic, when done by one of the finished operators like Jacobs, Segond or Pryor, give a mortality close to *nil.* I do a large number of vaginal hysterectomies for malignancy of the uterus, cervix or fundus and for small fibroids without a death, and it is one of the easiest operations I am asked to do. In suppurative forms of tubal and ovarian disease I do not consider the vaginal route complete surgery; the adherent omental and bowel adhesions and the diseased appendix are wholly neglected. The anesthesia I consider of the first importance and have little choice between ether and chloroform. In the South, with a good anesthetist, I like to employ chloroform; while at home, anesthetizers know little about chloroform, but use ether well. Recently in Winchester, Va., I had two clinics, five or six cases in each, for appendicitis, hernia, cystoma, hysterectomies and gallstones; these patients were produced rapidly by a young man giving chloroform with great skill. The operations were done rather hurriedly and the anesthesias were the best I have ever known in my operative work. They had little disturbance of any kind after these serious operations and all recovered. I never saw them again after they left the table. I

allude to this group of operations to demonstrate, *first,* that the anesthesia is very important, *second,* that rapid operating is important and, *third,* nursing and after care away from home, by physicians in many institutions other than our own, and in house to house operations, can be well done without mortality. We are not convinced that there are good and bad anesthetists until we get hold of a new or careless resident who fails to get the patient under ether until after the operation is over. He then collects himself sufficiently to kill your patient, if possible, while you are putting on the dressing. Just here the patient, if he does not succumb, is left in a bad condition requiring refined nursing, a talent not found in all hospitals.

The after and abiding bedside care is not to be found in many institutions; if you will visit your patient just before you leave the hospital you will often fail to find a nurse in the patient's room. The private sanitarium gave us the first good nurses and training schools and it is from these that we get the more successful and competent nurses for good work in surgery. Wherever such a school exists, there is a premium given the nurses, such as presents of a hundred dollars, a gold watch, or a trip to Europe.

I have referred very briefly to materials; animal ligatures give us at the present time about all the common accidents and deaths from hemorrhage, tetanus and sepsis. Occasionally we hear of a report of acute or chronic sepsis in a case or a series of cases, in which animal ligatures were used, whereas it is simply impossible to infect a patient with a boiled or steamed pure, fine silk. Good operators give animal ligatures a re-trial and then go back to pure silk. *The medical supply carpet bagger* is a dangerous man, he always has Murphy, Morris or Deaver silk, needle or instrument O.K.-ed by Murphy, Morris or Deaver, and the Maine or Texas doctor buys it at once. Commercial articles give the beginner, the young operator throughout the forty-seven states, a mortality *he should not have.* The preparation of materials by any of *you* in your *hospital* and used by clean *well-schooled hands* is safe and rarely gives a *mortality, but pure silk and silkworm gut are the safest and strongest of all materials.* Gauze is a drainage dressing and takes the best care of the wound of all materials ever tried. Cleanliness and everlasting vigilance in cleanliness from the very inception of an operation, in patient, nurse, operator and environs, distances infection. I believe in this city, some doctor recently, in criticising the filthy physician,

said: "The clothing and even the man should be consigned to the fire." This story and the dirty hands and habits of some surgeons reminds me of the criticism of Charles Lamb of his adversary in whist, "Egad man, what a hand you'd hold if dirt were trumps."

DISCUSSION.

DR. HERMAN E. HAYD, Buffalo.—As I have often said, there is no place where I like to meet Dr. Price so much as at our meetings, because there is no one for whose opinions I have greater respect. When I visit Philadelphia to witness his operations I am simply enraptured. The care with which he does his work; the organization which exists in his hospital; the interest he takes in every detail relating to surgery and in connection with his hospital are no doubt responsible, in a very great measure, for the wonderful results he achieves.

It was I who wrote him that letter in reference to the open treatment. I read at our last meeting a paper upon the necessity of opening an abscess and letting out pus when it could be easily reached, and then later, say in the course of one, two or three weeks, as the case might be, doing such a radical operation as would be necessary. I still adhere to that position. If, however, there is great difficulty in finding the pus; if to get at it there is a liability of injuring the bowel or bladder, such a procedure would not be indicated. In those cases of pelvic abscess which years ago I used to abandon—where the mass extended up to the umbilicus, where the densest adhesions existed between the bowel, other viscera and omentum—I now operate upon with success. It happened that I had six of that class of cases soon after I returned from a visit to Dr. Price. One was a foul-smelling extrauterine pregnancy, where the mass had remained for five months, and the condition that existed is difficult to describe. There was a pyogenic membrane surrounding the whole abscess cavity. I am satisfied if simple drainage had been provided by a small glass tube in that case the patient would have died, because nine days after the operation a fecal fistula occurred, and through that opening the fecal discharges escaped for a number of weeks.

In another patient who had a bad bowel tear down below the first portion of the rectum, at the junction of the sigmoid with the rectum, which it was impossible to close, I packed with gauze and she recovered. In still another patient whose bladder was torn like a cat-of-nine-tails, I sewed up the tears and packed with gauze, and although the woman has a urinary fistula, she got well. I made up my mind, therefore, that it did not matter so much for the first twenty-four hours what kind of drainage is used, but after that in these bad cases the open method must be employed

to take care of all the later discharges and complications which so often set in.

The advantage of the open treatment is in taking care of the later infections that occur on the third, fourth, fifth or sixth day, from injuries to the bowel and other viscera. Dr. Price places a coffer-dam, but only a mechanical engineer, such as he is, could have thought of building up from the foundation as he builds it up in these cases. I do not use the method which he employs, where he packs one piece of gauze above the other, but instead the Mikulicz nest, pressing into it pieces of loose bandage; and as the viscera come forward they lift up the gauze, which is removed from the fifth to the seventh day, the nest coming away a little later.

The trend of Dr. Price's paper is to accentuate the importance of the bad results that come from incomplete surgical work, and this is why it will prove of great value to all of us. Unquestionably his low mortality is the result of the complete work he does. He never gives up until he finishes an operation satisfactorily and completely. There is no doubt in my mind that it is because of his perfect technic that his splendid results appear, an important part of which consists in not overlooking collections of pus, postcecal abscesses, or circumscribed purulent peritonitis. Nevertheless, we cannot always take everything he says without a grain of salt, and when he condemns the use of rubber gloves there is another side to that question. Some men can sterilize their hands while others cannot. Wyeth, Morris, and other men have made experiments along this line. Morris, in particular, has written on the objections to the use of rubber gloves. No doubt one can do better work without than with gloves. But some surgeons are more liable to convey infection than others. Some surgeons cannot clean their hands with all the means at command. McGuire, of Buffalo, and Wyeth, of New York, have demonstrated this in their experiments and work. If you will examine the hands of Dr. Price, you will see that he has no finger-nails; he cuts them down to the quick. He can clean his hands thoroughly and perhaps does not need to use gloves.

It is a splendid thing for men to report their failures as well as their successes. In my paper on fibroid tumors I enumerated one case where my patient sprang out of bed on the eleventh day after operation. I found her bowels in the dressing and sewed her up again, and she got well. Such experiences Dr. Price does not have. He has a wonderful organization. He runs his hospital as a humane man ought to run it. I have tought repeatedly with the superintendent of our institution. I have begged her to provide more nurses to take care of sponges, and for other work in the operating room, threatening to take my work to another hospital with which I am connected. The superintendent finally gave me an extra attendant, but instead of being an experienced woman she was merely a visitor. On the third day after I operated in a pus case I could not get the patient's bowels to move.

I felt a mass in Douglas's cul-de-sac, and did not know what was the explanation. She began to vomit. I reopened the wound and a gauze sponge was found packed behind the uterus. The patient died the next day. It took a death to get that which we really needed—an extra competent nurse in the operating room.

It does not matter how poor a woman may be, when operated on by Dr. Price she has a private nurse for the first two weeks, who never leaves her night or day. Such an organization there is not in any other institution in this country.

So far as the animal ligature is concerned, I have used it for many years, and with the best of results. Every one of us has had the same experience with badly prepared ligatures. Where we prepare our own ligatures we rarely have any trouble, and never hemorrhage. The only cases in which I ever use silk are those in which I am dealing with the stump of the appendix and in operations on the stomach, or bowels; otherwise I use catgut prepared by Morris's method.

DR. ALBERT GOLDSPOHN, Chicago.—I, too, very much like to see Dr. Price operate, and most of the things he teaches with so much vigor should be taken as being seriously important. But a few things, such as the last speaker criticised, I also must criticise. When he speaks of imperfect surgical work in a general way it is most commendable; but when he includes in this the drainage of abscesses which open into the vagina that almost anybody would open, just as he would open a phlegmonous abscess where it points, then he is mistaken. These cases certainly occur to every extensive operator, and I do not apprehend that Dr. Price would do a radical abdominal section on the profoundly septic, neglected cases that we all sometimes get, with abscesses that can be drained via the vagina readily; cases that have had a high temperature for many weeks, and have a pulse of 150, sometimes not even perceptible. These patients, if subjected to a radical and complete operation, would usually die promptly. Now, we can drain in these cases with little or no anesthesia; improve their condition, and later they become able to withstand a thorough procedure which they would not endure in any man's hands in the first instance.

Let me mention some cases. A woman came to me who was sent by a physician residing in one of the Dakotas. She had been sick for about two months after an infectious labor. Her pelvis was full of tumefactions, with a fluctuating collection in the cul-de-sac of Douglas. Her pulse in the calmest moments was not below 150. She became so emaciated that finally she was practically skin and bones; she was able to take but little nourishment. This woman stood vaginal drainage, though it looked for a while as if she might die, but she recovered. It seemed that a radical second operation would be needed. But she made so good a recovery that she became pregnant about a year after going home, and went to term, proving the value of what was done for her by

a simple procedure, though her case looked exceedingly unpromising at the start.

A woman came into my hands who was hemiplegic for a year, with elevation of temperature, a feeble, rapid pulse, and in a septic condition from manifest pelvic abscess. Vaginal drainage was resorted to, shortly after which her condition improved greatly. Three weeks later I did a radical operation, and found a long-drawn-out appendix at the bottom of Douglas's cul de sac reaching across and adherent to the sigmoid on the opposite side, which was clearly the source of the primary infection. She stood the operation well, which would have been very doubtful at first.

A third case had been manipulated with septic instruments, an abortion induced, causing violent para- and perimetritis. The uterus was curetted in a harmful manner in a private house, and a big pelvic abscess promptly followed, so that the woman was in too deplorable a condition for radical work. This patient bore vaginal drainage very well, and after two weeks also a radical operation. I am satisfied that neither of these women could have stood a radical operation in the first instance.

As to the value of animal ligatures, I do not think there is much need of saying anything. It is well known that we boil these ligatures nearly as long as men usually boil their silk. Therefore, if there is any disadvantage which attaches to this material, it is that it is not quite so nice to work with.

As to sterilization of the hands and the use of rubber gloves what Dr. Hayd has said is quite true. There is a large individual difference in men's hands. Some men are obliged to use rubber gloves, while others are not. The surgeon who is careful with his finger-nails and takes every precaution to avoid infection of his fingers will not need this artificial protection in many instances. But every man should wear gloves in doing dirty work. He cannot otherwise keep his hands clean, I care not how much he protests to the contrary. This matter has been definitely settled by many long series of scientific bacteriological investigations.

Dr. Robert T. Morris, New York.—Without going over the various points brought out in the paper of Dr. Price, I would like to say a word or two regarding the use of rubber gloves, as it is a matter of much consequence. It is a question that needs rather elaborate analysis, and is not to be dismissed in a few words by anybody.

At the Hospital for Ruptured and Crippled, New York, the statistics of hernia operations show that suppuration has been reduced from 4½ per cent. to 1½ per cent., under the use of rubber gloves. This is a definite bit of data which is immensely important. The record is carefully made, and we cannot deny it. But this is in a special class of patients—hernia cases. Everything is in sight, and the surgeon can operate on most of them with boxing gloves. When we get into the peritoneal cavity and begin to separate adhesions, we have another question altogether to deal with. We must separate these two classes of cases as we would

separate the sheep from the goats, and if you attempt to separate peritoneal adhesions while wearing rubber gloves, you are liable to tear things that you ought not to tear; you must make large incisions and leave wounds open for a longer time, hence more bacteria will gain access to the parts than are carried in on your hands. I believe that it is a mechanical impossibility for any man to do the best work in abdominal surgery in adhesions while wearing rubber gloves. The principle is this: infection occurs not from the presence of one bacterium or two, but it is a question of dose. Now then, how are we to give a patient the larger dose of bacteria? By carrying them on our hands without gloves, or by making such a large incision and holding it open so long that three times the dose enters the wound? That is the principle in the case. Again, another principle: bacteria conveyed on the hands are carried in in different degrees of proliferation. A man whose hands are moist habitually carries actively proliferating colonies of bacteria in the epithelium. The man whose hands are habitually dry carries bacteria always in the epithelium of his hands; but the bacteria are not proliferating so rapidly, and the bacteria from the hands of a dry skinned man are not as dangerous as the bacteria of a moist-fingered hand.

Another principle is the cell resistance of the individual surgeon. This is an important factor in connection with this question. A man with strong cell resistance kills or holds in check bacteria in the epithelium of his fingers. A man with lesser normal cell resistance allows bacteria to proliferate with a greater degree of rapidity in the epithelium of his fingers; therefore, the surgeon with strong, natural cell resistance, holding in check bacteria in his fingers so well that the bacteria are not in an active stage of proliferation, is not liable to infect a patient who will be infected by the fingers of another man. Therefore, the problem includes the individual characteristics of the surgeon, his normal cell resistance, habitual moisture or dryness, and the like. Those are the features to be considered and those are the features which balance each other very well. If we use rubber gloves we are apt to make a wound so large and take so much room and work so much more slowly, that more bacteria fall into the wound than would be carried there on our hands. There is much more to be said on this question, but I do not wish to overrun the time allotted to me.

DR. JAMES F. BALDWIN, Columbus.—There is one point in Dr. Price's paper which has not been touched upon in the discussion. I do not know that we can do anything about it, but the point is an important one. He refers to the large number of hospitals that are being organized in the smaller towns throughout the country, and mentions the frightful mortality which attends the operations which are performed in those institutions. He asserts, and I presume truthfully, that the average mortality of abdominal operations at the present time is greater than at any other period in the history of abdominal surgery. The trouble, it seems

to me, is that these hospitals have what they call a "staff," and some man, as Dr. Price has stated, who a year or two before has successfully amputated some Irishman's leg, is made "surgeon" to the hospital. He is entirely incompetent to do abdominal work, and yet, because he is "surgeon to the hospital," he feels it incumbent upon his position to do everything that comes along, and the results are, of course, disastrous. I recently received a report from one of these little hospitals, in which the surgeon congratulated the readers of the report upon the excellent results which had been secured. This hospital is near Cincinnati, and Cincinnati surgeons have previously been doing the work in that locality. The mortality of this hospital in its abdominal work was just 25 per cent. Had the Cincinnati surgeons done the work I presume the mortality would not have exceeded 5 per cent.

What can be done about it? I do not know that anything can be done, unless it be to educate the people so that there shall be no "staffs" to these hospitals. There are one or two hospitals in Ohio where any physician in the neighborhood is free to operate. They have no staff. I was in Jacksonville, Illinois, a few weeks ago and found two successful hospitals there. Both the hospitals were well supported and doing good work, yet they had no staff. Any physician could operate there, and each operator stood upon his own feet. Each hospital formerly had a staff, and had no end of trouble.

With reference to rubber gloves, I think their great value consists in their use in closing an abdominal incision, especially when it is to be closed with animal sutures. At the Hospital for Ruptured and Crippled, in New York, to which reference has been made, I think they are handicapped, and elsewhere, by using rubber gloves during the operation itself in separating the different tissues; but when the operator comes to putting in his sutures, which are liable to become infected by pressing into the skin of his fingers, then he should put on rubber gloves to prevent this infection. If he does this I think he will accomplish all that can be accomplished by their use during any operation, while the operation itself will be better made.

At the last meeting of the Ohio State Medical Society I reported 1,000 cases of abdominal closure in which I had used a method which, in that series, had given me no known hernia. I do not use rubber gloves unless I use animal suture. If I use chromicized catgut, then I put on the gloves.

One other point in the way of a question: the second speaker alluded to the fact that he used silk for sutures in operating around the appendix and stomach. I do not know why. I have used chromicized catgut No. 1 in these cases, just as I have in other abdominal work, and have not had a particle of trouble.

DR. HAYD.—Simply because you do not use a sufficiently big knot not to pull through.

DR. BALDWIN.—By using merely the catgut we leave no material to become infected and make later trouble.

DR. CHARLES L. BONIFIELD, Cincinnati.—We all recognize Dr. Price's wonderful ability to such an extent that whatever he says carries great weight, and it requires a great deal of temerity to challenge anything he presents to us. What he has said about the results of his own hospital work is a lesson to the profession and to the laity. It will teach them that there is still necessity for abdominal surgeons; that the gynecologist, if we may so style him, has a field. But, however much we may admire Dr. Price and his results, we must read his offerings with a little doubt as to their absolute applicability to all of us. While it may be proper for Dr. Price, in most of his cases of suppuration in the female pelvis, to at once open the abdomen and do a radical operation for the patient's relief, it is certainly not the wisest procedure for the average abdominal surgeon, of even very considerable experience. It cannot be doubted that the latter will secure better results by primarily draining such of his cases as can be easily drained.

Drainage is not indicated in the cases mentioned by Dr. Hayd where the pus is high in the pelvis, difficult to reach, and with the added danger of damaging the bladder and intestines. But in a large percentage of cases the tube when it becomes infected gravitates behind the uterus, and pus localized in the pelvis outside the appendages frequently gravitates to this same position. Opening an abscess behind the uterus is but little more difficult than opening a boil. These cases then should be first drained and many of them will make a complete recovery. Those that do not may be subjected to a radical operation later with safety. As to catgut ligatures, most of us who have been using catgut for a number of years would be loth to return to silk, for if you use perfectly sterile silk in the most aseptic way possible, in septic cases it may become infected and after weeks or months give rise to fistulæ which are exceedingly annoying to both surgeon and patient.

We have heard a great deal about rubber gloves in this discussion and Dr. Morris has given us statistics to prove their value in one class of cases. In another class of cases he claims they are valueless, or worse, but gives us no statistics to prove this assertion, and we are bound to believe that he arrived at this conclusion simply by à priori reasoning. He says that by their use the number of cases that suppurated after operations for hernia were much fewer, but that the gloves should not be used within the peritoneal cavity because they dull one's tactile sense, thereby making longer incisions necessary and prolonging the time required for the performance of an operation; that these disadvantages more than counteract the benefits derived from their use. It is with this last assertion that I wish to take issue.

Rubber gloves do interfere with one's dexterity. But if they are thin and well fitting they only do so to a slight extent after one has become accustomed to their use. We have long ago learned that the length of the incision has nothing to do with primary mortality. It is also now a well-recognized fact that it

is not the germs that gain access with the air that is admitted, but those that are introduced on the surgeon's hands, instruments and materials that do the damage. Very long exposure and much handling of the peritoneum weaken its power of resistance, but the slight lengthening of the time by the use of rubber gloves could certainly have no appreciable effect in this way. One of the great advantages of rubber gloves is the readiness with which they can be cleaned. When the hand becomes contaminated during an operation it is impossible to delay long enough to thoroughly cleanse it. The rubber glove, on account of its smooth surface, can be cleansed almost immediately. Some German, whose name at this moment I cannot recall, conducted experiments along this line last year, and stated that gloves can be made sterile by simply washing them with soap and water.

DR. JOHN YOUNG BROWN, Saint Louis.—I did not hear all of Dr. Price's paper, but I agree with his views in regard to vaginal section, or, as he sometimes calls it, vaginal puncture.

At the last meeting of the Mississippi Valley Medical Association I reported nineteen cases in which vaginal section for drainage was resorted to for pus. Five of these cases were subsequently operated upon. I operated on four of them, doing abdominal section. One of the patients was taken ill five months after vaginal section, and she telegraphed me asking what she was to do. She was at Atlantic City. I referred her to Dr. Price, who did an abdominal section. I am reasonably confident that none of these patients would ever have come to abdominal section if they had not been drained through the vagina. The cases operated on were all desperately ill, and while I have seen Dr. Price attack these cases through the abdomen, I have not had the temerity to do it myself.

In the case he subsequently operated upon, the appendix was bound down and there were adhesions from sigmoid to cecum. He wrote me a letter after this operation calling me to task for having resorted to vaginal section. Had I not operated through the vagina, I am confident he never would have operated on the case through the abdomen.

In regard to the use of rubber gloves, I quite agree with Dr. Morris that in separating adhesions it is impossible to do the work as well with the gloves on as without them. I have tried time and again to work in the abdomen with gloves, and I must confess that I have not been able to do as good work with them as without them. In herniotomies I quite agree with him that we should work with gloves. In my own work the number of cases of stitch-hole abscesses, infection of wounds, etc., have been largely reduced by the use of the gloves. I believe this has been likewise demonstrated very conclusively by the statistics published by Bloodgood, of the Johns Hopkins University. He showed that infection was prone to occur when surgeons operated without gloves.

DR. EDWIN RICKETTS, Cincinnati.—Dr. Price makes use of the

expression, "house-to-house operating" in his paper, and I believe I am guilty of having inflicted upon this Association, at its Indianapolis meeting, a paper on this subject.

In regard to the remarks made by Dr. Hayd, who referred to the troubles that sometimes come to operators in hospitals owing to an inadequate supply of nurses, I wish to say that after many years' experience, in house-to-house operating, I have the greatest satisfaction in controlling the situation, including the supply of nurses as to numbers and quality.

As to ligatures, notwithstanding the remarks of Dr. Hayd and others, the tendency of operators to-day, especially those who are doing the greatest amount of work, is to use pure silk. I have a recent letter from a friend who is associated and working with Hans Kehr. He tells me that Kehr makes an incision ten inches long in doing a cholecystectomy, and in removing the vermiform appendix and the head of the colon. The wound is closed from beginning to end with silk, and is not disturbed for two weeks. Here is a man who has done 850 gallstone operations, and we are taught that this is an extreme ideal of antisepsis. In the hands of a great many operators to-day, I am sorry to say that the death-rate following abdominal sections is higher than it has been in the history of the world. This fact furnishes food for surgical thought. Reasons have been given for this, and they are known to you, as well as to me, hence I need not dilate upon the subject at this time.

As to drainage we all know Dr. Price's method of draining is one that cannot be questioned. We are familiar with the completeness of his operative work, and yet I must differ from him regarding the manner in which he opens the abdomen in dealing with pus. I quite agree with the last speaker in his management of the cases which he drained through the vagina. I believe, too, that Dr. Price would not have had that patient to operate on later if Dr. Brown had not drained through the vagina. As to the closure of the abdominal incision, I shall consider it in a paper that I am to read later in the session.

Dr. J. Henry Carstens, Detroit.—We have discussed this question a number of times in the past, but I cannot yet bring myself to agree with Dr. Price in reference to drainage. If I have to deal with a pus tube, and I think it requires drainage, I make a small opening in Douglas's cul de sac, and insert a rubber tube. The abdominal incision I close; the intestines, the bladder and rectum come together; the abdominal incision is clean, and the wound will heal nicely. I have no hernia, no stitch abscesses. Nature drains through the vagina without any trouble or interference. If by some combination of circumstances there has been agglutination of the intestines over the raw surface that is infected, perhaps above the rubber tube an inch or two, just around a loop of intestine where there is a little septic condition and a secondary abscess forms there, after a little while the pus will move in the direction of least resistance through the adhe-

sions which have been formed, and discharge into the cavity where the rubber tube is; it thus escapes and the patient gets well.

So far as rubber gloves are concerned, I will say that some men cannot keep their hands clean; some men cannot clean their hands. It is not their fault; they try their best. But there is that personality, which Dr. Morris told us of. They do all kinds of surgery. They handle everything from septic appendicitis to cases that are equally as bad, and their hands are dirty. They always stay dirty. They cannot clean them. In order to practise abdominal surgery successfully one must abstain from certain things. He must have his hands clean. That is an important point. An abdominal surgeon cannot afford to see cases of erysipelas, scarlet fever, diphtheria, and the like. It is the men who see these cases and operate who get the large mortality that has been referred to. It is better to do one thing and stick to it. If you should tear the rubber glove in operating, some foreign material may escape into the wound, and you are far more liable to infect a patient in this way than if you did not use the gloves. If I use gloves, I make it a practice to wear a brand new pair. I do not use an old pair that somebody else has used. Some surgeon may use a rubber glove, introduce his fingers into the rectum, and then try to clean the glove in say fifteen minutes, so that it can be used in other cases. I do not believe that one can clean such a glove in fifteen minutes. We know there are germs which will resist boiling for two hours; but somebody comes along and tells me that we can put the gloves in a little boiling water and in fifteen minutes can clean them. This is not true, because there are germs which we cannot kill in two hours. If the gloves are new, the supposition is that they are clean. In order to prevent my hands from becoming contaminated when I have a bad septic case, a case of cancer of the uterus, for example, I wear rubber gloves. Then, I think I am all right. By some peculiar combination of circumstances I may find pus when I do not expect it. If I detect it in time I put on rubber gloves, if my hands are not contaminated. I carefully clean my hands again, and if I have another operation again I wear rubber gloves, in order not to infect that case. I make my assistants wear gloves.

With reference to the use of catgut and silk, we have fought this battle over and over again. Some of us in the course of time began to use catgut. We used it more and more and had very little or no trouble with it. We did not find contamination. The only place to use silk, in my judgment, is in intestinal surgery, as, for instance, in cases of gastroenterostomy, where catgut will not hold long enough in order to get permanent adhesions, and we require silk to assist firm union of the intestine. For everything else, for tying the stump of the appendix, for abdominal and vaginal operations, in sewing up the incisions there is nothing better than plain dry sterilized catgut not chromicized, not formaldehyded, nor treated in any other way. I do not think there is any better suture material for closing the abdominal incision than cat-

gut. There are fewer hernias, fewer stitch-hole abscesses following its use, Dr. Price or others to the contrary, notwithstanding. I have used it in a thousand, or possibly twelve hundred cases, with good results. I believe it is far superior to silk or any other suture material, and I am going to continue to use it until someone can show me a better material.

DR. H. W. LONGYEAR, Detroit.—There is one point in connection with the use of rubber gloves that has not been touched upon—namely, that it is not our own hands alone which we have to look after, but those of our assistants as well. The care of their hands is more important than that of our own, so far as cleanliness and sterilization are concerned, for we know where our hands have been, but we do not know so much about those of our assistants, especially the internes of a general hospital, where we usually have to take them as they come in rotation. They may have been doing obstetric work, dressing wounds, or doing something about which we know nothing. This, in my opinion, is a most important use to be made of rubber gloves. If you do not use them yourself, make your assistants wear them. Since I began using them I have had far better results in all of my plastic work, and especially has this been noticeable in the abdominal incision and in the Alexander operation.

DR. RUFUS B. HALL, Cincinnati.—I wish to speak of gauze in connection with drainage as referred to in the paper. One of the speakers who discussed the question did not touch the point brought out by the essayist. I take it he does not usé gauze in all cases, but uses it or recommends it in the desperate, septic, pus-infected cases, as an additional safeguard to prevent further complications. For several years I have used gauze in that way in cases where I must drain, and I believe I have saved patients whom I would have lost without the use of gauze. I do not use gauze so much for drainage as to protect the cavity that is left, where the abscess wall is, where you have to peel off a pus tube or other structures to keep the clean intestines from coming in contact with the soiled field. In such a condition with a strip of gauze, I wall it off, or cover it over, leaving the gauze for a few days until the intestine becomes agglutinated, and does not come in contact with this dirty field. The essayist wanted to convey the idea that he only used gauze in the small minority of cases. If it is used in the way I mention, some desperate cases will be saved that otherwise would be lost.

DR. PRICE (closing the discussion).—I am glad some of the gentlemen discussed my paper in such a pointed way in alluding to the common causes of early or late deaths in pelvic or abdominal surgery. I appreciate what Dr. Morris has said. Some time ago Dr. Deaver and myself listened to Dr. Morris and saw some of his wonderful work, and whether one is young or rich in experience, it will benefit him to see his work. It will be a lesson to him. He will go home and do better work himself after seeing Dr. Morris.

The allusion by Dr. Morris to the work done at the Hospital for Ruptured and Crippled in New York is extremely interesting. Some years ago they did their surgical work in the afternoons, and many of the operations were done by the resident physicians, but things have changed. At the present time every operator goes there with his clinical assistant or assistants early in the morning. Those of you who wish to see operations there must go now at an early hour, or you will not see the work. The operative work is done after baths and douches, and a small breakfast. In their mortality statistics they lose sight of the fact that they do their work earlier now than formerly, before contamination takes place, and the reduction in mortality is not wholly due to the use of rubber gloves.

At the Samaritan Hospital years ago, Bantock operated during mornings, with a mortality of only one or two per cent., while Knowsley Thornton and others operated on patients at 3 P.M., with a mortality of 9 to 11 per cent. Martin and other German operators take a bath, a cup of coffee, and a roll, and operate in the morning, with almost a *nil* mortality. All the afternoon operators did their surgical work with a high mortality. Some of my assistants were formerly connected with public dispensaries. Years ago I operated at an early hour, with a mortality of 3.5 per cent., while my clinical assistants and colleagues, who operated in the morning upon all sorts of surgical cases met with in a large dispensary service—ulcers, whitlows, hemorrhoids, fistulæ, and the like—did abdominal and pelvic work in the afternoon with a mortality of 6.5 per cent. Mr. Tait operated at an early hour, with a mortality of 3.5, and at 2 P.M. with a mortality of 8.5. I value what Tait has taught us for he was a man of vast experience. If you wish to lower your mortality, operate in the morning while you are clean and your mental condition is the best, and before you prolong the anxiety of your patient.

Now that the internal medical man has acquired an accurate knowledge in diagnosis, he has become a useful member of society. Still, many cases are entrusted to the internalist when they really ought to be in the hands of surgeons.

I alluded to typhoid in my paper for the reason that we have lost two splendid clinicians who were operated on for appendicitis, but in a few days it was discovered that they were the subjects of typhoid fever, and both of them died.

We have made wonderful progress in diagnosis. I have crossed the Alleghenies probably one hundred times to see patients in consultation, and have only found general practitioners wrong once in diagnosis; hence, I say, we have made great progress.

With reference to the remarks of my friend, Dr. Carstens, I value what he has said. He has dealt with me this year with his hair curled and with gloves on. I have enjoyed his remarks very much. He has been very charitable toward me in this discussion.

We differ but little in our views in regard to the class of cases under discussion. Allusions were made by Dr. Goldspohn and Dr.

Carstens to a certain class of cases, for example, cases of post-puerperal lymphangitis, which were treated by incision and drainage, which relieved the sequelæ. In one case mentioned the woman conceived. One would hardly say that the tubes and ovaries in such cases are disorganized by suppuration. The pathological conditions could not have been very marked. Sometimes the fluid in these cases is free from germs. Many of you, if you saw this fluid with the microscope, would say it is free from germs and we will not drain. Others would say there are organisms in the fluid and we will drain. I have no doubt Dr. Goldspohn possesses an accurate, refined knowledge, and notwithstanding the woman possessed pus tubes she went home and conceived.

DR. GOLDSPOHN.—But she did not conceive until about one year after she went home.

DR. PRICE.—Dr. Goldspohn knows perfectly well that it was a pure case of lymphangitis, and not one of suppuration of the tubes and ovaries.

DR. GOLDSPOHN.—Neither you nor I would be able to say that when we saw the case first.

DR. PRICE (resuming).—I am satisfied that Dr. Goldspohn is capable of making that diagnosis.

With reference to the remarks of Dr. Brown who mentioned that the only operation the patients and their friends would permit him to do was vaginal section, he has had a series of fifteen or twenty successful sections for puriform disease, and he is thoroughly capable of doing a complete abdominal operation in the cases he has alluded to.

Time does not permit me to answer all of the points that have been brought out in the discussion. You have been very generous. You have benefited your fellow practitioners by being so frank and what you have said has not hurt my feelings in the least.

REPORT OF A FOURTH CONSECUTIVE SUCCESSFUL OPERATION FOR ACUTE PERFORATED GASTRIC ULCER, WITH GENERAL INFECTION OF THE PERITONEAL CAVITY.

By H. HOWITT, M.D.,
GUELPH.

In September of 1900, at the Louisville meeting of this Association, I read a paper on "Notes of Four Cases of Perforated Gastric Ulcer with Remarks;" in it I reported my first two operations for perforated gastric ulcer, and a year ago in Washington, at our annual meeting, my third was put on record.

For the purpose of clearness in regard to some points, I will give brief synopses of them in the order in which they occurred before touching the subject of this paper.

Case I.—Miss E. H., æt 15 years; anemic; previous history of gastric ulcer of six months duration; had vomited blood. Perforation occurred half an hour after a hearty meal and operation thirty-two hours afterward. Pulse rapid; temperature 102°, and abdomen rigid; general peritonitis. Large abdominal incision; watery pus in all parts of abdomen. Small perforation on anterior wall an inch above greater curvature near splenic attachment. Closed with silk. After thorough inspection and flushing of all parts of abdomen and pelvis, the incision was closed without drainage. Now, more than five years since operation, patient is in excellent health, and has never had a symptom of her former trouble.

Case II.—T. McC., male; æt 20; long history of gastric distress; never vomited blood; dilatation of stomach and pyloric stenosis.

Slight leakage occurred some days before complete rupture. Operation six hours after perforation; large abdominal incision; gas free in abdominal cavity, also pus and many pieces of partially organized lymph. General peritonitis and patches of peritoneal coat of intestines denuded. Distended colon had to be collapsed by a cut before the necessary evisceration was possible; abscess cavity found bounded by adhesion between colon, coils of

small intestines and omentum. Large, round perforation in anterior wall at pylorus; great thickening of parts; ulcer excised; gastroenterostomy. Sight inspection and flushing of all abdomen and pelvis; rubber drains for both flanks and pelvis. Recovered and had excellent health for more than two and a half years, then had perforation of jejunum by peptic ulcer. An operation again saved his life, and he is now in good health and doing farm work.

CASE III.—Miss K. F., æt 21; strong and robust; no history of gastric ulcer; never vomited blood.

The perforation took place six hours after a hearty meal; operation nine hours after it occurred. Large incision; distended colon incised and collapsed; evisceration. Large, irregular perforation on posterior wall close to lesser curvature; pieces of pickled cucumber and of other kinds of food found in lesser peritoneal cavity; ulcer closed; general sight inspection and flushing; flanks and pelvis drained. Recovered.

(For details of the cases, see the Transactions of the A. A. O. & G. for 1900 and 1902.)

The following is a report of my fourth case:

Miss G. M., æt 19 years; height 5 ft. 2 inches; weight 100 pounds; a small-framed, anemic young woman; family history good.

Previous History.—Except the usual diseases of childhood until her fifteenth year, she had excellent health. Shortly after the establishment of menstruation she became anemic, listless and nervous. In time the menstrual periods became irregular, and the amount of discharge less than normal, and wanting in color. The usual iron tonics were prescribed with indifferent results. Finding little beneficial results from medicine, her people sent her to the Northwest in June, 1902, where she remained until the following January. For a time, after reaching the prairie country, she improved greatly in every respect and her weight increased more than ten pounds. By August she was as well as she had ever been and could take hours of outside exercise without fatigue. Her health remained good until the middle of November, then, for the first time in her life, she had gastric distress after eating which gradually increased in severity. The pain came on one hour after her meals and lasted from half an hour to several hours. Sweet things caused more irritation than other kinds of food. She never vomited, but when the attacks of pain were severe, she often felt as if she were about to do so. The bowels were costive; no tarry stools were passed. Her appetite was good

but the pain caused her to be abstemious. The pain radiated to left side and, when severe, to left shoulder.

By Christmas she had lost in weight all that she had gained in the early months of her visit. On the 20th of January she returned home. Two days later, during the night she had a sudden and severe attack of pain in the epigastrium which caused marked signs of shock, but which passed off before her medical attendant arrived.

For supper on the 26th of the month, she was persuaded to take a hearty meal of roast beef, fried potatoes and cake, and at 10 p. m., after she had retired for the night, was given a cup of cocoa and a few biscuits. She slept soundly till 3 o'clock next morning, when she awoke with unendurable pain in epigastrium, which radiated into left side of thorax and left shoulder. This quickly led to a state of collapse in which the surface of body became cold and clammy. Her mother gave her a cupful of undiluted whiskey without any apparent effect. I saw her an hour and a half after the attack and found her temperature subnormal, pulse 90, abdominal wall set and rigid, respiration thoracic and superficial. The site of most intense pain was now in the left side of abdomen near anterior superior spine of ilium, but the pain in epigastrium, left side of thorax, and especially in left shoulder, was still very pronounced; no vomiting. The character of the attack and the history of the case made the diagnosis easy. The diagnosis having been made, in order to mitigate her suffering, a hypodermic injection containing half a grain of morphia was given and repeated in less than half an hour. As soon as possible, she was taken to the Guelph General Hospital and prepared for operation; this included thorough lavage of the stomach. At 8 a. m., the preparations were completed, and by this time the patient's temperature had risen to 99¾° F., and pulse to 120.

The operation was carried out in accordance with the method that I advocate. The peritoneum near perforation was covered with inflammatory exudate, and the abdominal cavity contained a large quantity of turbid fluid in which floated particles of lymph and other palpable matter.

The perforation was on the anterior surface of the cardiac end of stomach. It was the ordinary, round, glistening, peptic ulcer with the peritoneal aperture partially covered with shreds of lymph. Nature had evidently made an attempt to prevent leakage by adhering the part to the structures lying immediately in

front of it. Its calibre was of sufficient size to admit an ordinary lead pencil. It was closed with three rows of fine silk sutures. After thorough sight inspection and flushing of all parts of the abdomen and pelvis, rubber drains were used through stabs in flanks, and the abdominal incision closed with through and through silkworm gut sutures. Owing to the absence of marked tympanites and the situation of the perforation, the operation was much less difficult to perform than any of my other cases. An hour after the operation, the pulse fell to 100 and the temperature to 99°, and in less than twenty-four hours both were practically normal. Nothing but an occasional spoonful of hot water was given by mouth until the end of the third day, then albumin water, broth, ice cream and similar nourishment was allowed. She recovered without a single untoward symptom and has remained well ever since.

Acute gastric ulcer perforation, as understood by me, refers to those instances in which nature fails to prevent the escape of the gas, liquid, or other contents of stomach by adhesion of the part to adjacent structures. It has fallen to my lot to have had personal experience with six of these cases. Two of them occurred in my practice before the days of operative treatment. In one of these a post-mortem examination revealed a large, round ulcer in posterior wall and milk and oatmeal porridge free in both of the peritoneal pouches.

This patient died from shock shortly after the perforation took place, thus proving how quickly the escaped material may pass through the foramen of Winslow when the rupture is in the posterior wall.

No one will deny the vital importance of early diagnosis and prompt action on the part of the surgeon in regard to the successful management of unguarded perforated gastric ulcer.

The diagnosis should be comparatively easy when the patient is a young, anemic girl whose previous clinical history indicates, however feebly, the presence of a gastric ulcer, nor should it be difficult in the majority of the other cases. In most instances there is a history of after-meal gastric distress and often other symptoms indicating the existence of the ulcer. Whether such history is obtainable or not, the sudden onset of intense pain in the epigastric region, the pronounced shock, the rigidity of the abdominal wall and the thoracic character of the respiratory movements aid us in arriving at a correct conclusion; but if in addition to these the attendant finds that the initial pain radiates

and the position of the greatest suffering changes in the manner to be described presently, a diagnosis may be made without delay.

In the early stage, the pulse and temperature are not reliable guides, for the former may not be accelerated, and the latter only slightly subnormal.

There may be rare instances of rupture of the gall-bladder or perforation of the duodenum in which the symptoms closely simulate those of gastric perforation, but here fortunately the indication for prompt surgical treatment is practically the same as that for the condition under discussion.

The administration of morphia in the early stage by masking the symptoms often prevents timely diagnosis and prompt surgical treatment. With rare exceptions it is the general practitioner who is first called to attend the case. He finds probably little, if any, disturbance of the temperature and pulse, and, having sympathy for the intense suffering of the patient, gives a hypodermic injection of morphia. In a short time, owing to the marvelous effect that morphia has in this stage of the trouble, the pain is completely relieved, the rigid abdominal walls become relaxed, and the character of the respiratory movements normal; but in less than twenty-four hours all is changed again, and on the arrival of the consultant the patient is beyond the power of human skill. Until general practitioners become more familiar with the true import of the initial symptoms, successful operations for acute perforated gastric ulcer will not be common.

Do the symptoms indicate the situation of the ulcer? Yes, at least in a manner sufficiently definite to give the surgeon a practical knowledge of the site, especially when a complete history of the case previous to the rupture is obtainable; but in the rare instances, in which no previous history of gastric ulcer exists, we must be guided wholly by the character of the initial symptoms that follow acute perforation.

Let us take, first, the indicating symptoms which occur before perforation. When one of these ulcers approaches the peritoneal coat of the stomach, an area of local peritonitis is produced in that portion of it. This area, though small, is very sensitive to pressure or any form of irritation. Hence the posture of the patient in bed is of some import; for instance, with the ulcer in the anterior wall, he is more comfortable when lying on his back; when it is near pylorus, he avoids the right side and is easier when lying on the left, and so on, according to the position of the ulcer. The posture assumed by the patient is that which causes

the least pressure on the part and which keeps the contents of stomach away from the ulcer.

Again, when an ulcer in this stage is situated in the anterior wall, and in that part of it which can be affected by pressure from without, slight point pressure directly over it causes severe pain. By this means the exact site of the ulcer can occasionally be determined. When the trouble is on the posterior wall, it requires deep pressure to produce the same effect.

Whether caused by irritation of food, pressure or otherwise, the pain, especially when intense, radiates in certain directions, according to the part of stomach affected. When the ulcer is at or within a few inches of the pylorus and on the anterior wall, the pain radiates to the right or to the right and downward, but in any other portion of this wall to the left side and often into left shoulder. When on the posterior wall, it radiates into that portion of back immediately behind it and to right or left, according to whether it is to right or left of the median line of body, and frequently upward into the intercapsular space.

Symptoms that indicate the situation after rupture: Immediately after perforation occurs they are practically the same as those that have just been described, only of much greater intensity. They are at times difficult to obtain, owing to the condition of the patient; besides, these important initial symptoms are soon covered by the terrible pain produced by the escaped contents of stomach gravitating downward in the abdomen. The rapidity of this change depends upon the size and situation of the perforation and the amount of food in the stomach. Other things being equal, it takes place more rapidly in perforation of the anterior wall. The situation of the acme of pain follows the downward course of the material. In perforation of anterior wall to left of median line, the material, and consequently the pain, follows the course of the descending colon. In acute perforations in all the other situations, the course taken is generally along the ascending colon toward the pelvis.

When the previous history and initial symptoms are not obtainable, if the patient is first seen when the most intense pain is in the right iliac region, a mistake in diagnosis may easily be made. A few years ago an article appeared in either the *Annals of Surgery,* or the *Medical Record,* which contained five or six good illustrations of this mistake, all verified after operation by post-mortem examination.

The special symptoms to which your attention has been called

are those which have been observed by personal experience. They are only applicable to the acute perforating ulcer, or those cases in which there are no adhesions to prevent general infection of the abdominal cavity.

It may be said in regard to the matter that new ground is being broken. Further observation in this particular branch of the subject on the part of others, who have greater opportunities, will probably extend and improve our knowledge of the symptomatology of the acute perforating gastric ulcer.

There is a very marked diversity of opinion among surgeons in regard to the proper method of dealing with cases of general septic infection of the peritoneal cavity. Some advise an abdominal incision in size merely sufficient to deal with the original trauma and leave the peritoneum to take care of all the rest; while others add to this some form of drainage. The greater number of our authorities speak despairingly of the large incision and condemn evisceration, temporary enterotomy, and like steps which necessitate more or less exposure of the abdominal contents. The question then arises: Which is the lesser of the two evils, want of thorough peritoneal toilet, or exposure of intestines with proper precautions to keep them warm and moist? Time will decide the problem, and in regard to general septic infection of the peritoneal cavity from perforation of the stomach or other portion of the upper intestinal canal, I have no hesitation in stating that in my opinion the decision will be in favor of the large abdominal incision and such steps as will permit thorough toilet of the peritoneal cavity. Is there any possible hope for our patient if we close the abdomen and leave behind palpable particles of partially digested vegetable and animal food?

I hold the same belief in regard to the method of treatment of all cases of septic peritonitis of whatever origin in which tympany is a pronounced symptom.

In general infection from perforation of a gastric ulcer in which distention of the abdomen is a prominent symptom, the stomach is collapsed and crowded up under the ribs and diaphragm in such a manner that it is utterly impossible for any surgeon to suture successfully the perforation without resorting to temporary enterotomy and evisceration; and if it were possible to do so, how would he remove the highly irritating contents of the stomach which have escaped or rather have been forced from the organ among the coils of intestines or into the lesser peritoneal pouch?

Here a large incision collapsing the distended coils of intestines, when necessary, by one or more temporary enterotomies and evisceration, renders the work of closing the perforation and the thorough toilet of the whole peritoneal cavity easy of accomplishment in a shorter time, and with less damage to the delicate structures, than is possible by any other known method.

It should be the sole duty of one of the assistants to keep the exposed bowels covered with warm, moist, sterile gauze and constantly irrigated with water at a temperature of 102° F. A separate irrigating apparatus with a large and somewhat forcible flow is required, in order to flush quickly the numerous nooks and pouches of the abdominal cavity.

When the perforation is large, it is my practice to use three soft rubber drains, one for each flank, well to the back through a stab in the depression below the kidney, and the third for drainage of the pelvis through a puncture of the lower abdomen to right or left of median line, and as far as possible from the main incision.

The surgery of the stomach has a large future for useful work—much larger and important than is commonly supposed. The branch of it, to which your attention has been directed in this paper, is of much less importance than many of the others.

Take, for instance, the numerous and often serious complications to which the chronic gastric ulcer gives rise. There are thousands of these patients, great sufferers too, who belong to this class, and who are still ineffectually treated for dyspepsia by medical remedies when surgery offers them a very safe, quick and complete relief.

DISCUSSION.

DR. C. H. MAYO, Rochester, Minn. (by invitation).—I have been very much interested in the results obtained by the essayist—namely, four consecutive cases of operation for perforating gastric ulcer.

If anyone, in doing surgical practice, begins to imagine that there are any fixed facts or anything he can turn to and say that this is the way to operate on this case, and that is the way to operate on that case, when he comes to a surgical society and listens to a discussion, such an illusion will soon be dissipated. So far as the essayist's cases are concerned, he had remarkably good results. If I understood him correctly, in no case was gastroenterostomy performed but that he succeeded in most of these

cases in excising the gastric ulcer. The diagnosis can be made before the time of operation if these patients are in the hands of most of the ordinary practitioners. But a few of them, as the author states, have not had their symptoms diagnosticated; they have seen no physician, and all of a sudden symptoms of perforation manifest themselves. But these cases are rare. One of our cases was of that nature.

We have had several cases of the type the essayist has described. Our experience has found about an even number of cases of perforation in the pyloric region of the stomach, and also in the first portion of the duodenum; that the results and symptoms are about the same for either position; that the character of the ulcer is about the same, and in the stomach perforations, the chronic irritation, as a rule, has been of such a nature that it is almost impossible to close them. They can be drained, but as far as doubling the wall is concerned, it was impossible because of its thickness and the brittle character of the tissue, as our cases were of a chronic character. In the duodenum this is not so marked, because there is a difference in the anatomical structure. The question, then, will come up—namely, can the permanent cure of a gastric ulcer best be undertaken by gastroenterostomy? as the ulcers are often multiple where there is no perforation; at the same time, the ulcer can be excised, if it is deemed advisable at the time of the operation. The inflammatory area must necessarily in the majority of cases produce more or less obstruction of the pylorus, so that while one would temporarily cure the case by plugging the opening with omentum, by suture or by excision, these would not relieve the patient of future trouble. Then would come the difficulty in all these cases of ulcer, unless possibly the one described at the cardiac region of the stomach where the pylorus is free, to make a gastroenterostomy at the time. Again, the question presents as to the method of making the gastroenterostomy, and whether to resort to the posterior or anterior incision. There is no question but what posterior gastroenterostomy, when it is properly performed, is much better as to permanency and is a more successful operation than the anterior; at the same time, the anterior is primarily the safer. The anterior operation at times may have to be followed by an enterostomy.

In regard to large, hard ulcers, with perforation, in two such cases after doing gastroenterostomy we passed a tube through the perforation down into the intestine for feeding purposes. The pylorus was blocked and that is a reason for perforation in chronic ulcer. If you have a patulous pylorus, it would tend to prevent perforation, although in the acute round ulcer that is not so.

With reference to the method of operating, while posterior gasteroenterostomy involves more risk, yet it gives better results; the anterior operation is the simpler, in that it gives a very low mortality; it can be performed with the Murphy button or the McGraw elastic ligature with about an equal degree of success.

Of course, the Finney operation is often out of the question, because it may involve the diseased area and occasionally there would be leakage at the suture line after a few days. I believe adhesions above the umbilicus from almost any cause are much more apt to be permanent, while adhesions below the navel, if we succeed in removing the primary cause of the disease, will frequently and almost always disappear—at least, they will not produce any trouble; while above, if we succeed in gall-bladder operations, in operations for ulceration of the stomach, the adhesions may be more or less permanent, and we have to reoperate for adhesions above more frequently than below.

As to drainage, most operators have settled this question for themselves. There are no fixed facts about drainage. It is very much like the use of silk or catgut. If a surgeon with a large experience gets good results by using a certain suture material, as silk or catgut, or if he succeeds by drainage, he is foolish to change. Some men drain and get successes; others do not and are equally successful. The followers of Dr. Price will continue to obtain good results by adhering strictly to his methods and technic, but let them change their methods for a time and their mortality would increase until they succeeded in working out new theories to meet the changes in their own minds concerning these questions. In a case of leakage from ulcer of the duodenum or pylorus, where it does not involve the whole area, I would rather close or repair such a leak without drainage. In more extensive infection I would drain with a small wick above, close to the opening in the ulcer, do a gastroenterostomy, and irrigate the abdomen. It makes no difference whether there is salt in the water or not. The results of irrigation before and since the use of salt are about the same. Plain water serves the same purpose, but almost everyone now uses salt, and we do likewise. We use a large glass drain in the lower part of the abdomen away from the line of incision, as we want a dry peritoneum. The patient is placed in the Fowler position to allow the fluids to gravitate to that part of the peritoneum which is less absorptive, and has a less number of orifices or mouths for taking up the fluid. Some operators close cases of infected peritoneum and obtain good results, yet when we operate on these cases we can tell which are the ones that have perforated, from permanent adhesions formed. A large glass tube will drain the peritoneum in from twenty-four to thirty-six hours, while gauze is not a good drain except primarily. A glass drain is not irritating to the peritoneum and is allowed to remain from thirty-six to forty-eight hours, after which it is removed for fear of necrosis of the bowel. Up to that time it is a perfect drain in healthy areas.

Dr. John B. Murphy, Chicago.—I wish to congratulate Dr. Howitt on his record. I do not feel that we are at liberty to criticise his procedure when we consider his results. The record of four consecutive successful cases of acute perforation of gastric ulcer is striking, and is worthy of the highest commendation,

because it involves more than the technic. It involves his decision to proceed at once on definite lines and on the symptoms that are presented. This is more important than the technic. It involves immediate action. It would matter little what Dr. Howitt did in the way of drainage or in the way of scrubbing or flushing the abdomen if he did not act in time. The time to operate on these cases is before the peritoneum has been irreparably injured. This may not be the first day. Many times the stomach is not full at the time of perforation. Furthermore, the stomach contents in normal state is less septic than that of any other portion of the alimentary canal. The irritation from it is less than from any other portion of the alimentary canal excepting the duodenum. Therefore, the element of time in a case of perforation of the stomach may be less important than that when a man has a perforation from typhoid ulcer.

Every man who is familiar with operations for perforating gastric ulcer knows that the abdomen can be filled with fluid and still this fluid can be removed, the gastric ulcer excised by whatever procedure may seem necessary, the abdomen drained and the patient recover. With the same period of time elapsing after a typhoid perforation, the rule is that the patient dies, because of the greater degree of sepsis and of injury to the peritoneum in those cases. The indications for action, however, are not so clear. Therefore, I congratulate the essayist more on his timely action than on his technic.

I do not quite understand the point made by Dr. Howitt where in one case he placed two drains, I believe in the loin. Did he endeavor to get into the lesser peritoneal cavity and drain it? I would like to know whether he drained the greater peritoneal cavity also. If it was the greater peritoneal cavity, it was unnecessary, because the fluid would accumulate in the lower abdomen if the patient was put in the sitting posture.

DR. HOWITT (closing the discussion).—I am under the impression that Dr. Mayo misunderstood some of my remarks. If I understand him correctly, he stated that gastroenterostomy should always be performed in a case of perforated gastric ulcer. If this is correct, then I beg to differ materially from this method of treatment. In gastric ulcer we have a certain condition of the gastric juice present, that is, hyperacidity. If the ulcer is situated away from the pylorus and does not cause obstruction of it, what can be the benefit of doing a gastroenterostomy? In my second case of perforated gastric ulcer there was complete obstruction of the pylorus, hence it was necessary to resort to the procedure, but what was the result? In two and a half years afterward the patient had a perforation of the jejunum by a peptic ulcer. I cannot understand why Dr. Mayo advocates gastroenterostomy in acute perforated gastric ulcer.

In regard to the performance of gastroenterostomy for malignant troubles of the stomach, this operation is undoubtedly very beneficial, but in acute gastric ulcer or even in cases of chronic

gastric ulcer, gastroenterostomy should always be avoided if we wish to escape future trouble.

In regard to whether we should do anterior or posterior gastroenterostomy, this matter should be left entirely to the judgment of the attending surgeon. I have done gastroenterostomy, with the exception of Dr. Mayo, as frequently as any other man in the northern part of this Continent, and with a few exceptions I have done the anterior operation.

I believe that when we expect our patient, after recovery, to assume the erect posture and walk about, the anterior operation is the better one to adopt. When it is done in accordance with the method that I have frequently advocated, there will be no trouble or after results such as often follow the usual way of performing the operation. If the patient is weak and we have very little hope that he will again assume the erect posture, then I would advocate posterior gastroenterostomy.

In the matter of drainage (I am speaking now of the acute perforated gastric ulcer, which differs from the chronic ulcer in several respects) if the perforation is sufficiently large to permit the escape of particles of food, then I say we must inspect the whole peritoneal cavity and drain, or we run serious risk of losing the patient.

I agree with Dr. Murphy that the time differs very materially when damage to the peritoneum takes place. It all depends on circumstances. According to my view, the size of the perforation, the character of the pathogenic germs present and the resistance of the patient are important factors. In some cases we may operate successfully much later than in others. In one of my cases I operated thirty-six hours after perforation had taken place; here the perforation was small and only slight leakage had occurred. But when the perforation is large, we must be quick because erosion of the peritoneum takes place early.

There is another fact to be noted—namely, the higher the perforation takes place in the intestinal canal, the quicker the absorption of the septic material. With a perforation in the stomach, the duodenum or the jejunum, there is greater danger of sepsis taking place earlier than when the perforation occurs down in the rectum, the sigmoid flexure or the colon.

SHOULD THE UTERUS AND OVARIES BE REMOVED IN OPERATING FOR DOUBLE PYOSALPINX?

By CARLTON C. FREDERICK, M.D.,
BUFFALO.

WHETHER to remove all of the woman's sexual organs, at the time that it became necessary to remove both tubes for pus, has been a mooted question since surgical gynecology has begun its modern development. The field was a new and untried one, with no data upon which to base a judgment as to the advisability of so doing. A consideration of the woman's physical condition, when she is carrying a pair of pus tubes, is quite necessary, as a prelude, to the argument on this question.

The woman who has a pair of pus tubes is, as a rule, an invalid. Some are able to be about and attend to small duties of their vocation. Pain is an almost constant symptom, and that alone, on physical exertion, serves generally to confine her to her couch a greater part of the time. Some cases, however, do not suffer so severely. Fever, emaciation and anemia are common to a large percentage of them. This, however, is not the invariable rule, as we have all seen severe cases in whom no fever, headache, or general emaciation were present. Sterility and suppression of all sexual feeling are the rule, and when the inclination does exist, the pain produced by coitus is well nigh unbearable. Dysmenorrhea is almost universal, whether the woman has been a subject of painful menstruation prior to her disease or not. If she has had dysmenorrhea before, she certainly will have it more severely while suffering from disease of her tubes.

Too frequent and too profuse menstrual flow are also common occurrences, with a prolonged duration of the flow. Leucorrhea is not always a prominent symptom in these cases of long standing. Earlier in the history of every case, leucorrhea was a prominent symptom, but the uterine mucous membrane, after a time, seems to recover from its acutely diseased process and the dis-

charges, in consequence, become less. It, however, is present to some degree in most cases, due no doubt in many more to the congestion of the uterus from the diseased appendages than from causes within its body.

The history of operative procedure in these cases has passed through three quite well-defined periods. The operation as first practiced by Tait and his followers, for several years, consisted in removing both the tube and ovary through the suprapubic incision, leaving the uterus. In making a pedicle common to both tube and ovary, there was of necessity an incomplete removal of the tube, leaving, in most cases, a part of the proximal end. Many of them were cured and others were not cured, the failure being in many instances, doubtless due to a continuance of the diseased process in that part of the tube remaining. Some of those who had undergone this incomplete operation were again operated, the uterus was removed, and in many instances a cure resulted. The natural inference was that the uterus was the offending organ, which prevented cure after the first operation. Hence arose the teaching, that the uterus should be removed with the diseased tubes in order to insure success. Following, came the resort of the French school to vaginal operation for pus tubes and then, of course, every vestige of uterus, tube and ovary was removed, whether it was necessary or not. I have sat in the clinic of many a noted operator and have seen a comparatively healthy uterus and both healthy ovaries removed by vaginal section for a salpingitis of one side, and sometimes there was no pus in either tube. This extreme procedure went on till the fashion of vaginal section began to wane, and the right minded operators began to return to the abdominal route. During all this period the results of total extirpation of the sexual organs upon the life and health of the woman were noted.

The physiological effect of total removal of uterus, tubes and ovaries is an enforced menopause, with all the ordinary symptoms associated with the change in the life-history of the woman, only intensified, in proportion as the artificial menopause is near to, or remote from, the normal age of its natural occurrence. The nervous symptoms are much more pronounced in a goodly percentage of cases thus brought on, than when the menopause occurs at the normal time and in the normal way. The younger the woman is, in my experience, the more intense are the nervous symptoms, and the older she is, that is, the nearer she is to the normal age of the natural menopause, the less severe are these

symptoms. With the removal of the ovaries comes a gradual decrease in the sexual appetite of the woman, till at last it is completely lost. Coincidently, of course, there is atrophy of the vagina and the pelvic floor, tending to descent of the bladder and possibly, eventually, a vaginal hernia.

Learning by observation and being obliged to treat these poor sufferers, has gradually awakened in the minds of many operators a desire to prevent such results, and we should all be gratified to see a return to the abdominal section, with its possibilities of conservative surgery. And now we come to the third period of the history of operations for double pus tubes.

After an experience of about fifteen years with these various surgical procedures, and noting the effects of these operations, we are in a position to decide quite accurately, the amount of pain, discomfort and illness due to disease of the various anatomical parts of the woman's sexual apparatus. As a result of these observations and deductions, we are in a position to state positively, that it is not necessary to sacrifice all of these organs, when they are not all hopelessly diseased. In other words, we are justified in removing nothing but those organs which are distinctly diseased, and we are in duty bound to retain for the woman all that are not diseased. I believe that it can be stated as a surgical principle which can not be questioned, that our duty, when consulted by a patient for operation, is to afford that patient the greatest possible relief from the symptoms complained of, with the least mutilation, and the preservation of every organ possible to enhance the most perfect performance of all bodily functions.

The most common order of events in the development of pus tubes is, first an endometritis, the infection then extends to the tubes, one or both and later, possibly, to the ovaries one or both, producing a pyogenic sac therein. The common origin of the primary endometrial infection is gonorrhea, or some pus infection at, or after labor or abortion. Each of the three anatomical structures which are involved, *seriatim,* in this infective process are different histologically, and behave differently as the result of infection.

There can be very little doubt, that the tubes are the most natural rendezvous of a continued and prolonged infective process, because of their histological structure, and also because of their shape. Very soon after the infection begins in them, their fimbriated ends are closed, swelling and contraction of their

uterine ends seal that point of exit for the accumulated secretions, and, as a result of no drainage, the diseased process continues. The uterus, on the other hand, continues to drain freely and in time recovers a mastery over the diseased process. The ovary is diseased, only incidentally by its attachment to the fimbriated end of the tube during the acute process. The ovary is abscessed in a relatively small proportion of pus tubes operated upon. After pus tubes have existed for a period of months or years, I believe that the endometritis is a very minor pathological condition and that whatever discharge or endometritis exists, is, to a large degree, dependent upon the major pathological condition—the pus tubes.

Neither the uterus nor ovaries are the natural habitat of inflammation to the same degree that the tubes are. It is in them that inflammation may continue for months and years, perhaps in a semidormant state, yet capable of breaking out into a fresh and actively acute attack at any time, from no discernible exciting cause.

I believe that the diseased Fallopian tubes are the chief factors in the production of the pain, discomfort and invalidism incident to chronic pelvic inflammations. And I believe that with double or single pyosalpinx we must resort to complete exsection of the tube or tubes in order to arrest the disease. By complete exsection, I mean, removal of the tube and cornu of the uterus down to the uterine mucosa, closing the V-shaped chasm in the cornu with catgut and whipping over the free edge of the broad ligament out of which the tube has been stripped. I believe it to be as unsurgical to leave a part of the diseased Fallopian tube as it is to leave a part of the diseased appendix. Since I have been doing this operation, I have not seen the failures to cure that were my experience before. If an ovary is abscessed, which fortunately does not exist in a large percentage of cases, it too may be removed, or the abscessed portion resected. Or the abscess may be opened, its pyogenic membrane dissected out, and the cavity treated with pure carbolic acid and closed. The rule should be to save as much healthy ovarian tissue as possible; even if it be only the fourth or eighth part of one ovary, preserve it. In some rare instances the uterus should be removed, but the occasion *is* rare. If the condition is known to be tubercular, the uterus should certainly be removed. But even if both tubes and uterus are taken out, still preserve all the ovarian tissue possible. For the past five years I have been studying the results of leaving

in healthy ovaries in those cases of fibroids needing hysterectomy. The results have been very satisfactory. I am thoroughly convinced that we have no right under any circumstances to sacrifice an ovary or any part of one, which is not absolutely and incurably diseased.

With both tubes removed, the woman is sterile. So she was before operation. Besides, she was sick and she was suffering pain at all times and especially at menstruation. Removal of her diseased tubes will cure her pain and her dysmenorrhea, that is, if she is not normally subject to painful menstruation. Although sterile, every woman during the child-bearing period should have her menstrual function preserved to her. Its loss is prejudicial to her well being. This is especially true of younger women, and as I have before stated, the younger the woman, the more prejudicial it is. A woman who is deprived of her sexual organs to the extent that she does not menstruate, is conscious that she is unsexed, and the mere knowledge of the fact preys upon her and makes her feel inferior to other women. The effects are psychic; there are more remote ones acting on her sympathetics, producing nervous and nutritive changes. During the child-bearing period nearly every attribute that woman possesses is centered in her sexual system, and the removal of those impulses, be they mental or more remote ones upon her other bodily functions, will seriously change the whole course of her life in many important respects. Therefore, we should not remove the uterus if it can be retained; we should not remove any more ovarian tissue than necessary, but we should remove the tubes *in toto*. By so doing, will we best fulfil our duty to our patient, by making her a more perfect woman physically, mentally and physiologically.

DISCUSSION.

Dr. Robert T. Morris, New York.—This paper is one of the most important that can possibly come before the Association for discussion. It is written on lines that some of us have been working along for a considerable time. The cry of to-day is to save as much ovarian tissue as possible. If you cannot save all of an ovary, save a little of it. If, however, you must take it out on account of marked pathological conditions about it do so. Take it out, put in salt solution and then insert it in the peritoneum or elsewhere, so that it will furnish its ovarian secretion if the ovary itself is good. Then the uterus will not degen-

erate. If the ovary is put in the right place, the woman may become pregnant later. This is all new work, and it is along lines that will give us new inspiration. An ovary transplanted in the same patient does not degenerate. It has a tendency to furnish new ova and secretions. Graft an ovary into another patient and the tendency is for it to degenerate.

As to removing the uterus: when we have removed the septic tubes we have taken away the greatest cause for distress, and the patient then may become much better and her cell resistance greater, and the different groups of gonococci coming up from beneath the epithelium will be inhibited, and in a short time, say a few months or a year, her cell resistance will have increased to such an extent that she kills all the gonococci. The disease is self-limited. It comes to an end, and she is saved from continued infection.

A great many men talk about the exceptional cases. I am talking about the other cases. There are cases in which the uterus and ovaries are sacrificed because of pyosalpinx, in which we could avoid a precipitate menopause. There are cases in which we may avoid the increased danger which accompanies the removal of the uterus. There are also cases in which we may have pregnancy, and there are others in which we can avoid the mental effect that goes with the knowledge that the uterus and ovaries are gone.

DR. RUFUS B. HALL, Cincinnati.—I wish to endorse the position taken by the essayist and by the last speaker. I believe that we owe it to our patients not to remove ovaries if they can be saved. I have been working along these conservative lines for a number of years. In a case of gonorrheal infection that came under my observation, in which one tube was filled with pus and the other contained no pus that could be discovered by the eye, yet was glued down with adhesions, there was a question whether that tube ought to be removed. I left this tube. I removed one tube and one ovary that were involved, in the suppurative process. I have operated on a number of similar patients doing precisely the same operation, and in every instance where the infection was due to gonorrhea I was compelled to go back later and remove the tube that was left. That is not without some advantage to the operator. It may have been of some advantage to the patient, but my intentions were good. In other patients, where the infection was not due to gonorrhea, and one side was removed at the operation, seldom did I have to do a second operation, for the reasons given by the essayist—namely, because I did not cut short menstruation. In young women, or women under forty years of age, if I were to remove a suppurating ovary holding six ounces or more, and a suppurating tube, and the ovary on the opposite side was not involved in suppuration, I would leave the ovary on the side that was not involved. I recall a case that was brought to me quite a distance from a neighboring city, the patient, aged thirty-three years, having been operated upon some three weeks before. The woman had

been in bed for four or five months, and had a mass in the abdomen as large as an ordinary pitcher. The question occurred to me: what can I do to save the woman's sexual organs? I was unable to determine exactly what to do before opening the abdomen. I found a suppurating ovary and tube, and these were removed. On investigation I found the woman had a suppurating tube on the opposite side not connected, however, with the ovary. I removed the tube in the manner described by the essayist, and left the woman's uterus and ovary. Of course she will not bear children. I did not expect to preserve that function, but my aim was not to unsex the woman physiologically, so that she would not menstruate. But my experience is that these women are better if we can only leave an ovary or half an ovary, so that they can menstruate, permitting nature to bring on the menopause gradually in three or four years. I have had a few cases where I have left one-third of an ovary, and as a consequence menstruation has continued for three or four years, at the end of which time the menopause was established. These women are better off mentally and bodily when we resort to such conservative measures.

DR. WALTER B. DORSETT, St. Louis.—I agree with everything Dr. Frederick has said with reference to leaving an ovary after hysterectomy if it is not diseased, but I cannot endorse the proposition to leave an abscessed ovary. I cannot endorse the suggestion made by Dr. Hall. I have never seen an ovary with an abscess in it in which I could draw the line of demarcation between the abscess and healthy ovarian tissue.

DR. HALL.—I believe in saving an ovary where the tube on the corresponding side is abscessed, but not the ovary. I never leave an abscessed ovary in a case of gonorrheal infection.

DR. DORSETT (resuming).—That is the only point I want to make. I have never seen an ovary in which there was inflammatory disease or pus in the tube, in which this line of demarcation existed so clearly, that one could say, "I will cut it off here and leave the remainder." When I have to deal with an abscessed ovary I take it out. If, on the other hand, I have a well-defined abscess of the tube in which the inflammation stops at the fimbriated extremity I do not remove the ovary if it is healthy. To repeat: if I have to deal with an abscess of a tube where the inflammation stops at the fimbriated extremity, and the ovary itself is healthy, I take out the tube and leave the ovary; but if there is pus or an abscess in the ovary, I would take it out also.

DR. MILES F. PORTER, Fort Wayne.—I heartily concur in all that has been said along the line of conservative operations on the tubes and ovaries. Dr. Hall referred to the most important impediment which is thrown in our way in working in this direction. It comes from the general practitioner. If we are to do the work as it should be done, one of the first things for us to do is to instruct the general practitioner that the ovaries have

some function to perform other than that of making the woman a breeder or child-bearer. It is quite a common thing for the general practitioner to say in the course of a fibroid operation, "You are taking out the whole uterus; why not remove the ovaries at the same time?" And these practitioners stand in the way of progress along this line.

DR. BYRON ROBINSON, Chicago (by invitation).—The subject of extirpation of the genital organs has occupied the minds of gynecologists for twenty-five years. The first and foremost ground to establish is that the ovary is the central sexual organ of woman as the testicle is that of man and, hence, should be removed for grave reasons only. The day of Battey's normal ovariotomy is past. General and amateur surgeons dare not present whole platters of ovaries at medical meetings any more. The ovary appears to be a life-long functionating organ, or at least while its parenchymatous tissue exists—even in the sixties, sometimes. It ovulates before birth and well along in the old age and doubtless produces internal secretion. It ovulates and produces some kind of internal secretion and maintains the balance of the nervous system. It should, unhesitatingly, be totally extirpated for carcinoma and sarcoma. For almost any other disease—inflammation cysts, fibroma, abscess, dermoid,—the ovary can be partially retained by resection, leaving in situ at least a small portion of the ovarian parenchyma. The ovary need not be entirely removed for ovarian abscess any more than the hand or foot should be amputated for abscess. An ovary with abscess should be thoroughly incised and drained precisely as an inflamed ovary may be incised and drained. I frequently incise ovaries and drain them per vaginam.

Some thirteen years ago I was Mr. Lawson Tait's pupil. He was a brilliant genius,—the greatest surgical genius of his age. However, his extreme views and practices induced me to reverse them in my subsequent gynecologic practice. Mr. Tait began at the ovary, the wrong end of the tractus genitalis, but he was in accord with the prevailing views of his day. The ovarian end, the proximal end of the tractus genitalis, is relatively seldom ill, and if diseased it is almost always secondary. It is the distal end of the tractus genitalis, especially the pudendum and uterus, that is first diseased and later the oviducts from trauma, infection and malignancy. Ten years ago Dr. Lucy Waite and myself began systematically to preserve all or part of the ovaries, and seldom during that decade has a patient been deprived of both ovaries unless both were attacked with malignant disease. One can almost in every patient preserve a small part of ovarian parenchyma. Time has demonstrated the correctness of this view and practice. If woman realized the essential, sexual nature of the ovary she would object to ovarian extirpation as a man does that of the testicle. As regards the removal of the uterus and oviducts,—the menstrual organ,—I hold and practice different views. The menstrual organ,—the uterus and oviducts,—is an organ of tem-

porary use and function, active from puberty (twelve years of age) to climacterium (fifty years of age). The menstrual organ is practically independent of the ovary as far as mental and bodily effect is concerned in extirpation. If the oviducts are extirpated the menstrual function generally ceases in six to twelve months. The presence or absence of the uterus without the oviducts produces practically no difference on the corporeal or mental habitus of the patient. If the genital disease be sufficiently severe to remove both oviducts the uterus is generally so gravely infected that the patient is better off without it. A woman with bilateral pyosalpinx of gonorrheal origin is almost canonically sterile. Gonorrhea is the typical disease which is notoriously bilateral, for the habitus or home of the gonococcus is the tractus genitalis. The gonococcus will live in the tractus genitalis when all other pathogenic bacteria perish, for the gonococcus, by trauma, builds its own home and, besides, makes atria for all other bacteria. Now the gonococcus gained the oviducts through the uterus and hence definitely invaded its tissue during its journey.

Gynecologists well know the persistency of gonorrhea, its incurability when it passes proximal to the os uteri internum. Besides, removing both oviducts cuts off the connected, solid anastomostic circulation of the uterus and ovaries just as precisely as the additional removal of the uterus. I claim in general that during ten years of careful, personal observation and special practice in gynecology that better results have been obtained in cases of established, chronic, bilateral gonorrheal pyosalpinx by extirpation of uterus and oviducts than by extirpation of oviducts only; 90 per cent. of the work and entirely the most successful portion of immediate and remote results has been executed per vaginam. In reply to the distinguished gynecologist who says, "Remove the oviducts and in a year the woman will be well," I remark that I cannot afford to have my patients wait a year to be relieved or get well. The preservation of the uterus minus the oviducts is not worth a year's idle, painful, waiting, especially when practically nothing is to be gained. To remove one oviduct in gonorrheal infection is to prepare the hope for a second operation. Mr. Tait once remarked to me he had reoperated on nearly every patient where at first he removed one oviduct only, in gonorrheal cases. Besides, he said nineteen out of twenty cases of double pyosalpinx are of gonorrheic origin. If the "pelvic abscess" or one oviduct be infected by other bacteria than gonorrhea it can be incised and drained per vaginam and will practically become well without removal. Many a time and often have Dr. Lucy Waite and I removed the uterus, subsequent to the removal of oviducts by other surgeons because the woman was ill, the uterus infected with gonorrhea and remained diseased, year after year, making the patient's life miserable and that of an invalid, with no advantage by retention of the uterus. The false idea of so-called conservatism, of in-

cising the abdomen, resecting portions of gonorrheal oviducts, inserting them into the uterine walls, with the claim of preserving the gestating power of the woman is an illusion as it succeeds about once in a thousand times, while the other 999 subjects are possessed of diseased tissue. One of the most distinguished gynecologists of this country said he had never had such a case which was followed by pregnancy

DR. W. D. HAGGARD, Nashville.—I heartily agree with the proposition that the ovaries should not be removed in doing hysterectomy. I think, with Dr. Frederick, that the uterus and adnexa should be allowed to remain in cases of double pyosalpinx, and, moreover, the ovaries should be saved in operating for pus tubes, as they are usually healthy and only innocently involved owing to their juxtaposition to the infundibula.

Dr. Dorsett discusses the propriety of removing an abscess of the ovary. In the great majority of cases this is undoubtedly necessary, but I think the time will come when we will be enabled to shell out those abscesses in some special instances. Dr. Murphy has advocated in certain cysts and abscesses of the kidney, leaving healthy renal structure. I believe we may sometimes be able to leave healthy ovarian stroma even in the pus cases. I recall examples of abscess in an ovary on one side, having been evacuated, the ovary sterilized by carbolic acid and alcohol, with recovery and immunity from further trouble.

Generally speaking, the uterus should be retained. There are cases of extensive adhesions of pus tubes to the uterus so agglutinating everything that after enucleation the whole posterior surface is raw, and if you leave the uterus you invite and incur fresh adhesions of the bowel, giving rise to future distress and danger of ileus. In these instances hysterectomy is preferable, and in some very aggravated pus cases complete enucleation is only possible, combined with or following hysterectomy, by bisection of the uterus.

The ovaries should, I say again, always be retained whenever possible. I disagree with the last speaker. Even if the uterus is only a menstrual organ and serves that purpose from the age of fifteen to forty-five, if an ovary is retained so that the woman may menstruate, it will give her a great deal of mental comfort. It will preserve the internal secretion of the gland, and preserve the sexual function unimpaired. I apprehend that there is no difference of opinion in regard to the complete exsection of both tubes, and comparatively recently we have learned to excise the tubes directly from the cornu of the uterus. In this way we do not have future suppuration from the uterus, even though it be retained, and no trouble with a septic stump and its attendant complications. I feel that we have made a distinct step in advance when this association is so uniformly of the opinion that the ovaries should always be saved wherever possible.

DR. ALBERT GOLDSPOHN, Chicago.—I fully agree with everything the essayist has proposed, and confirmatory of that I am

ready to make the following declaration: that if we will, in the first place, not make the mistake that is often made, of operating on these genital pelvic cases in the acute stage of inflammation, but will wait until a subacute or chronic condition is obtained by rational rest and medical treatment before operating; and secondly, if we will carefully exclude the cases in which the infection is not from the genital tract, but from the appendix vermiformis, then we can preserve the function of menstruation in at least 75 per cent. of all women with double pyosalpinx. I could prove that proposition if I had several months' time to collect my cases, and I am sure the number would reach two hundred.

How can it be done? In the first place, it is very essential to make a distinction at the outset between pelvic peritonitis and disease of uterine adnexæ caused by appendicitis, and a similar pelvic status due to infection via the genital tract. The former should, as a rule, be attended to at once, while the latter should be given a previous course of several weeks of recumbency and rational medical care and then be operated. Then the operator will see that he can dare to save many parts that formerly he would certainly have removed when all the parts looked about equally angry, or diseased. In order to obtain the above mentioned results, diseased tubes must be exsected from the uterus. Tying off a tube does not shut it. The tube is open or patulous again in a comparatively short time, and any infection that obtains in the endometrium is free to be emptied into the peritoneal cavity again, which accounts for much of the misery for which some gentlemen have blamed the uterus.

At the outset a thorough curettement must be made, and if the cervix be pathological at all, it should be amputated well up within the vaginal insertion. Then do the abdominal section. Remove the pus tubes, as above described, but save one or a part of one ovary. The lone uterus has often lost its proper carriage and becomes a fit object for ventrofixation—not ventrosuspension. Thus you have a patient who will menstruate, lessening the evils that have been delineated for her present life, and she retains thereby many of her social prerogatives and fares much better should she ever desire to marry again.

DR. E. C. DUDLEY, Chicago (by invitation).—I quite endorse the proposition to save everything which is not diseased or which has a fair prospect of recovery, and on this point I am in strict accord with the essayist. The reason why so many uteri gave trouble after the removal of the tubes and ovaries in former times was because the tubes were not always carefully and thoroughly removed. This explanation was brought out fully by Lawson Tait. The tubes should be removed right into the horns of the uterus so as to get out every particle of them, and the uterine wounds should be carefully closed with sutures so as to close the endometrium completely off from the peritoneal cavity.

The menopause often cures pelvic disease. Experience has

shown that, when the tubes are thoroughly removed, atrophic changes and cessation of physiological function in all the pelvic organs take place. Pathology may be defined as physiology modified by disease, and atrophic changes, when they arrest physiological processes at the same time, may put an end to pathological processes. The physiological function of the uterus is usually destroyed by thorough removal of the tubes and ovaries whether it is modified by disease or not. If the earlier operators had always removed the tubes clear into the horns of the uterus this discussion would probably never have taken place.

If in a given case the tubes and ovaries have to be removed and the uterus is so involved in the results of infection that the walls of it have undergone extreme changes and are like the walls of an abscess cavity, it would, of course, be wise to remove the uterus also. I can hardly think, however, of a single case of complete removal of the tubes in which I have regretted the failure to remove the uterus together with them. In some cases the uterus has remained heavy and large, but after a year, more or less, it has passed into a state of senile atrophy and has ceased to be a pathological element.

On the question whether the ovaries should be removed also when the tubes are removed, I am also thoroughly in accord with the author. It is a good principle in surgery to save what can be saved. Most assuredly, in a large proportion of cases, even of hysterectomy, considerable ovarian tissue may be preserved and may afterward remain healthy and harmless. Of course, if one wishes to arrest physiological and pathological activity in a much diseased uterus the tubes and ovaries should be removed completely.

DR. J. HENRY CARSTENS, Detroit.—We have other cases than those that have been referred to. For instance, a woman is suffering from dysmenorrhea. She has a certain condition of the ovaries, perhaps cirrhosis. She is laid up two or three days of every month on account of suffering. She is incapaciated from following a useful vocation. She is suffering, we might say, from a kind of menstrual insanity, or a neurotic condition which makes her physically unable to earn her living. What will you do with such a patient? Those are the cases in which we must remove every particle of the ovaries, and bring about that change in the nervous system which is brought about by the menopause. There are patients whose ovaries we do not want to save. If we have such a case, what is the use of opening the abdomen and removing the uterus when we can take the uterus, ovaries and tubes out through the vagina and make the woman well in about a year. If she is a young woman and expects to get married, certainly you ought to try and save an ovary or even one-quarter of an ovary.

If the uterus is diseased and lacerated in every direction, requiring curetment and afterward an abdominal section to remove the tubes and one ovary, leaving the other ovary, to

stitch the uterus to the anterior abdominal wall or to make an Alexander operation in such a case is absurd. In such a case I would take out the two tubes and the one ovary that is diseased, leaving the healthy ovary, so that in four or five months my patient would get well. I hold that to be good practice. There are cases in which it is good practice to remove both ovaries. There are others in which it is a good thing to remove both tubes and one ovary and the uterus. There are still other instances where it is wise to save the uterus and one tube. It depends very largely on the case. Do not try to lay down any rule. You cannot do it. You must take cognizance of the particular pathological condition. You must consider the woman's age and everything else in connection with her case. This, at least, is the way I look at it.

DR. FREDERICK BLUME, Pittsburg.—We are discussing to-day a subject which, within the past ten years, has occupied a good deal of the time of this association. Since the days of our Toronto meeting in 1894, when Dr. Ross reported his personal experience with pus tubes, we have endeavored yearly to arrive at some understanding about the management of this class of cases without being very successful.

At our meeting last year Dr. Murphy, in a discussion of this subject, criticized the term pelvic peritonitis as generally used in this class of papers, and suggested that more attention be given to the description of the pathology. Now, in a paper like this presented to-day, something more should have been said about the pathological conditions of the pelvic organs, especially about the uterus. The author should have clearly expressed himself so that we may know under what circumstances he thinks the uterus should be preserved. Is it advisable to leave the uterus in those serious cases of double pyosalpinx where the pelvic organs, bowels, and omentum are firmly matted together? What is the post-operative condition of the patients if the uterus is preserved? How many of these women remain invalids? These and many other questions must be settled before an understanding can be reached.

To-day one of the speakers advised against ventrosuspension in non-inflammatory cases of retroflexion. He held that the opening of the abdomen is too serious a matter for this class of cases, because adhesions form which render the condition of the patients worse after than before the operation. We all will admit that even in these clean cases, adhesions may result from the section in a certain number of the cases. That such adhesions are the rule after suprapubic conservative operations in pus cases, often leaving the patient an invalid, has been denied time and again, yet every operator with some experience in secondary operations will admit it. The unsatisfactory result of the conservative abdominal operations is one of the reasons which led many surgeons to operate through the vagina, to remove the uterus with the appendages in those chronic cases where these organs are hopelessly diseased.

Dr. Price repeatedly expressed the opinion that vaginal hysterectomy is an incomplete procedure and not curative. He stated that he has been compelled to do many secondary operations to get these patients well. We, in Pittsburg, within the past few years have seen quite a number of women, coming from the East, upon whom conservative operations were performed, and who now required the removal of the uterus to get well. I hope to have the opportunity to-morrow in the discussion of myomectomy to report a case that came from Philadelphia, which is very instructive as to the limitation of conservative operations.

Dr. John B. Murphy, Chicago.—I think we need to go back to the pathological condition. The last gentleman was emphatic in his remarks regarding the removal of the uterus, I take it, in cases of adhesions, and that all of the troubles that followed the previous removal of the other organs were due to the fact that the uterus was allowed to remain. I do not agree with him. We have been over the same ground with other tracts repeatedly, from the gall-bladder down. First, we thought it was good practice to drain, and a little while after this was not considered good surgery at all in reference to the gall-bladder, and it was said that we ought to take it out. A little while later, this was not considered good surgery. The same holds true with regard to removal of the ovaries, tubes and uterus (the pan operation). In considering these cases we must not disconnect cause and effect. If we have a gonorrheal pus tube in which (if we have symptoms from it) we have the mucosa closed at both ends or comparatively so, there being an increase in the quantity of fluid each month, the tension element is the great factor, and not the adhesive element. When my friend, Dr. Blume, removes these adhesions he still has other adhesions that follow to contend with because he has an abraded peritoneum, it makes no difference whether he takes out the uterus or not, for the symptoms are not attributable to the adhesions.

In regard to removing a pus tube, and I am speaking now specifically of gonorrheal pus tubes, which means a stricture of the uterine end and closure of the fimbriated end, I have yet to see the first pus tube that has had a stricture within one-quarter of an inch or half an inch of the uterus. The stricture is usually five-eighths of an inch from that; beyond this is the dilated area, and all that is necessary is to remove the dilated part beyond the strictured portion. It is entirely unnecessary to remove a woman's uterus because she has gonorrhea. If we were to reason on this basis, we might as well remove the male urethra in a case of stricture. If the woman has a "rotten" uterus, take it out. This practice of operating and removing every uterus because the tubes and one ovary have been removed should be condemned; it is not worthy of discussion before a learned body.

Dr. Charles L. Bonifield, Cincinnati.—I only wish to detain the association for a minute or two. I remember very well when I studied grammar there were a great many rules, to which

there were a number of exceptions, and this is the best way to view this subject. There are certain rules which govern us very largely, but there are also exceptions to them.

I heartily agree with Dr. Hall when he says in cases of bilateral gonorrheal pyosalpinx it is, as a rule, necessary to remove both tubes, but there are exceptions to it. I did an operation for bilateral pyosalpinx, removing one tube in its entirety and one-half of the other, and the patient afterward gave birth to a child, which is conclusive proof that once in a while we can save one tube in these cases.

In the discussion of this subject we have dealt too much with the disease and not enough with the patient. What are we going to do with the patient? It depends on her social condition. In a poor working girl, who is on her feet ten or twelve hours a day, six days in every week, there is not much chance for conservative surgery. On the other hand, in a patient who is well-to-do, who can afford to take the chances of a secondary operation for the sake of giving birth to a child, or having her menstrual function maintained, conservative work should always be tried. If one wishes to do conservative surgery on the appendages he must not operate in the acute stage of the disease, but let nature do all the healing she will before he lays on his hands. The patient should rest in bed before operation is undertaken, until her temperature has been normal for a long time.

DR. FREDERICK (closing the discussion).—I am very much obliged to Dr. Murphy for answering some of the points that have been brought up in the discussion. This is not a question of sentimentality, but one of good surgery. It is your duty to your patient to conserve as much tissue as possible. Dr. Carstens said the uterus should be taken out; there are instances, no doubt, where this should be done, but they are rare. When I find a necrotic uterus I take it out, but I venture to say that 90 per cent. of the uteri associated with double pus tubes are not "rotten." We should clean out the uterus with a curet before we open the abdomen. You can determine the condition of the uterus in this way. If you have a lacerated cervix to deal with, sew it up. I contend that it is our duty to a woman to maintain her menstrual function, to retain her ovaries or an ovary, so that she can get the benefits of the menstrual function, together with the other functions. It does not make any difference to me whether a woman is worth a million dollars or five dollars; I will practice the same conservatism.

I do not believe in opening the abdomen and resecting the tubes with the idea of pregnancy occurring later. I not only think it is absolutely senseless, but I believe it is criminal. If you have to deal with a pus tube on one side and the other tube is adherent, plugged at its fimbriated end, I believe this last mentioned tube should be taken out. While pregnancy occurred in Dr. Bonifield's patient, one might do conservative surgery for years with similar hopes of witnessing the occurrence of pregnancy,

yet it probably would not result in one out of three or four hundred cases. It is not worth the chance of doing a secondary operation. I have done many secondary operations, that is, where I have not resorted to complete exsection of the tubes at first operation. I now take out every diseased tube I find, and I do not leave a tube on the opposite side if it is diseased. Furthermore, there is no need in enucleating a pus tube to detach coils of intestine from the side of the uterus.

If the woman shows no signs of obstruction of the bowel prior to operation, leave the intestines that are adherent in Douglas's pouch, lift out the tube and ovary, and leave the adhesions on the posterior uterine wall. You have a little pocket and the intestine will drop in there, adhere to the side, and there will be no trouble from bowel obstruction. Suppose you should peel off coils of intestine that have not given symptoms of obstruction, the first thing you know you get bowel obstruction. There is no necessity of doing this. Make your incision large enough; put the patient in the Trendelenburg position; work carefully; pack off with gauze; work down; lift up the tube and ovary, and if the ovary is not all abscessed you can leave a part of it. I have done this many times. Abscess of the tubes should not be operated on in the acute stage by abdominal section, but they should be carried along until the pus becomes sterile, until the microorganisms, by the limitation of their nutrition and time, become old and decrepit and will not infect the peritoneum. If you get one of them, pack off the rest of the peritoneum, bring up the ovary, open down into the pus sac in the ovary and clean it out; then dissect out the pyogenic membrane and disinfect with pure carbolic acid. If it is an old case, one in which the pus organisms are not very active, the ovary will heal and you will have adequate ovarian stroma which will materially help physiological function, so far as the ovarian processes are concerned.

There is no more danger in opening a sterile pus sac, dissecting out the pyogenic membrane, and disinfecting with carbolic acid than there is in having an old pus tube rupture while you are enucleating it. Wash it out and close it up. If the pus is sterile the patient will recover, and there will not be signs of a septic process in the peritoneum. True conservatism should be practised in this work. As I have previously remarked, it is not a matter of sentimentality, but what is best for the patient. Dr. Robinson said that Tait took out all of the diseased tubes. As I stated in the first part of my paper, Tait and his followers did not remove all of the diseased tubes.

THE INDICATIONS AND TECHNIQUE OF VAGINAL DRAINAGE FOR SUPPURATION IN THE PELVIS.

By A. GOLDSPOHN, M.D.,
CHICAGO.

During decenniums and centuries past, different parts of the internal female generative organs have successively been regarded as the chief sites of inflammatory disorders. In earliest times, when the most crude ideas on this subject prevailed, naturally the uterus was blamed mostly. Later the tubes and ovaries came in for a prominent share, and in more recent times, the pelvic peritoneum was exploited, mainly by Bernutz and Goupil as a chief seat and a distributor of inflammatory processes to the generative organs invested by it. With reference to the areolar connective packing tissue that fills the spaces not otherwise occupied between the pelvic organs and beneath their peritoneal envelope, it must be admitted that it is scarcely bulky enough to become the seat of what in other parts of the body would be called a phlegmonous inflammation, without causing secondarily by continuity a local peritonitis also. But this important tissue is so filled with blood vessels, lymphatics, and glands, and it is so very extensively and necessarily present in the female pelvis—and in macroscopic or tangible quantities too—that its capacity for evil when it becomes infected is great, and to overloook or ignore this fact is an equally great error. The relative abundance and distribution of this tissue in the female pelvis and the abundance of lymphatics and blood vessels in it, were well demonstrated by frozen sections of the pelvis made by W. H. Freund and mounted in alcohol. Others have attempted less successfully to show the course that infections of tissue would or might take in it, by artificial injections of it with glue or mucilaginous fluids. In more noticeable amounts, this tissue is found subperitoneally upon the borders of the uterus, along the base of the broad ligament filling the space between the vaginal vault below, the pelvic peritoneum

above, the rectum behind and the uterus and bladder anteriorly. It is present throughout the entire broad ligaments and in the smaller ones known as the sacrouterine ligaments. It is distributed along the round ligaments to the external (subperitoneal) inguinal rings, likewise along the uterovesical ligaments to the cavum Retzii in front of the bladder whence it communicates with the femoral rings and canals. This distribution of the areolar tissue makes it quite clear why abscesses occurring in it, if left to themselves, rupture spontaneously, in the order of frequency usually into the rectum, the vagina, the bladder or the skin near Poupart's ligament, or over in the femoral canal. Likewise, the almost exclusive source of infection (labor or puerperium) of this tissue is also accounted for by its relative abundance about the cervix uteri in that portion of the extra-peritoneal and supravaginal space above described, which expands, certainly during the later months of gestation, and during the expansion of the cervix uteri antepartum. Then, taking in connection with this circumstance, the further well known fact that the cervix uteri during mature and also premature childbirth, becomes very thin and soft like a succulent membrane, that abrasions or slight lacerations upon it during parturition are quite the rule, and that the lymphatics and sometimes small veins in it are then wide open, it becomes obvious enough why infection of the parturient channel during labor and during the puerperal period, will pass most easily, directly and continuously through the cervix wall,—the then most vulnerable and also exposed portion of the uterus,—into the cellular tissue in the expanded paracervical space and cellulitis (parametritis), is self-evidently the initial inflammatory process, as is abundantly demonstrated by careful clinical observation. Pelvic cellulitis or parametritis as Virchow named it, was recognized as a pathologic entity coördinate in rank with pelvic peritonitis (perimetritis of Virchow) by this the lamented father of cellular pathology himself. He recognized both of these as distinct, although frequently combined pathologic processes and gave to each its proper place. There is, therefore, no need nor excuse for doubting the pathologic bearing of this pelvic cellular tissue when it becomes infected (in puerperio). Nevertheless, some would-be modern lights appear to discredit this fact either in word or impliedly by opposition to all vaginal operating for infectious conditions in the female pelvis. In this they are, however, as much in error as were some of their fathers of the last generation who mistakenly regarded as pelvic cellulitis cases that

were really diseased appendages and pelvic peritonitis. Parametritis does and must occur, and as a primary process, too, as long as women become infected during childbirth; and the cicatricial connective tissue contractions that occur in the chronic and atrophic form or ending of this process have recently been shown by Freund to be a cause of hysteria.

The valuable postmortem observations of Bernutz and Goupil were correct enough in themselves, but their conclusions were wrong because the cases they studied were not such as died from infection during labor, but they were cases of pelvic peritonitis and diseased adnexæ, such as are the rule almost exclusively when infection occurs at any other time than during labor or the early puerperium. In the absence of the peculiar parturient conditions above described (expansion, thinning and abrading of the cervix and expansion of the paracervical connective tissue spaces during labor), infection, when it passes beyond the vagina and the cervical mucous membrane, causes successively an endometritis, endosalpingitis and localized peritonitis about the ovary and opening of the tube where, accordingly, we find peritoneal adhesions most frequently. It usually never causes parametritis (pelvic cellulitis) in such cases unless traumata (perforation of vagina or cervix) have occurred, as from accidental, unskilful or criminal use of instruments. In the absence of such traumatism an internal gonorrheal infection, for instance, occurring as it usually does not near labor, will practically never cause a parametritis.

Abscesses occurring in the areolar tissue about the cervix over the vaginal vault, even if they do engage the peritoneum above, will make themselves known not merely by a tumefaction, but also usually by some encroachment upon the vaginal cavity; and certainly everyone should, and probably does, open such abscesses from the direction in which they "point"—into the vagina. Hematoceles, and sometimes circumscribed peritoneal exudates, when they become infected, will form abscesses that are readily accessible from the posterior cul-de-sac and should certainly be evacuated into the vagina, and obliterated by means of suitable drainage into it. If there are inflamed appendages or nonpurulent exudates higher up, they are thereby given a better chance for spontaneous improvement or recovery; and in case a secondary celiotomy is nevertheless required later, it will be with less extirpation of adnexæ usually and a much lower rate of mortality than would have obtained in a primary radical operation. When in cases of this kind the vaginal incision shows, however, that

either the extravasation of blood, such as arises from ruptured or aborted tubal pregnancy mostly, or the inflammatory exudate is not purulent, then I always do a ventral section immediately also, fulfill all the indications within the pelvis completely, and drain into the vagina; unless the affected parts in some cases are exceptionally well accessible by the posterior vaginal incision alone or supplemented by an anterior vaginal celiotomy.

More questionable than in the foregoing is the proposition to drain tubal sacs which occur in distinctly organized lumina, originally lined perfectly with mucous membrane, and likewise the proposition to drain ovarian abscesses because of their multilocular or honeycomb structure. Theoretically, these are quite formidable considerations in histologic pathology; and they will hold true, too, as contraindications in most multilocular abscesses such as are usually present in ordinary tuboovarian septic conglomerates. But they will not hold true in larger unilocular tube sacs that can be emptied and packed, nor in ovarian abscesses whose honeycomb structure can be broken down by a finger into one cavity and this likewise solidly packed. The gauze packing in these cases should remain *in situ* at least a week. The purpose of this is two-fold:

1. Abstraction of culture media and prevention of continued suppuration by copious capillary drainage during the first two to three days.

2. After this time the capillary drainage capacity of the gauze is usually ended; but its continued presence is needed to hold the walls of such sacs or cavities widely expanded and to arouse a layer of granulation tissue upon them by its irritation as a foreign body. It is evident that this can be achieved upon or in place of the mucous lining of a pus tube, which has usually lost much of its vitality and histologic structure; and that it can be accomplished upon the walls of a simple or a multilocular ovarian abscess after its friable septa have been broken down, is clear enough. Some cases of parametritic abscess beginning in the puerperal state, and some cases of pelvic peritonitis with diseased adnexæ, particularly those arising from a leaking vermiform appendix that hangs low down into the small pelvis, are too profoundly septic and altogether too much reduced to endure a radical operation at once. To such cases the preliminary drainage is a life-saving measure by improving their condition so that they can bear a radical operation later with about the same lower rate of mortality as others do that are not so reduced. Again, where a

radical operation becomes necessary secondarily, the preliminary vaginal drainage enables the inflammation to subside in the uterus, or tube or ovary, that may be associated with the hopelessly diseased parts in the same case, so that the former need not be removed, as would have been deemed necessary if the radical operation had been performed in the first instance or during the acute stage, because a better line of demarcation has been drawn between the redeemable and the hopelessly diseased parts.

Most of the cases that in my experience have required a secondary radical operation after vaginal drainage of pelvic abscess, have been either clearly or most suspiciously cases in which the infection came from the vermiform appendix. In cases where the infection came by way of the genital tract, a secondary operation has not been required in as much as 10 per cent. of the cases. The gross anatomical condition that most strongly invites vaginal drainage of pelvic abscesses as an auspicious procedure is that they may be accessible, by being situated low down and by some distension of the posterior cul-de-sac, thus creating an increased space between the posterior surface of the uterus and the rectum. This will be true of nearly every parametritic (cellular) abscess, of suppurating hematoceles, of exudates usually, and sometimes of ovarian abscesses or the larger unilocular tubal sacs.

TECHNIQUE.

Some years ago, in a private house, I drained a laterally located pelvic abscess by a small incision laterally and posterior to the uterus. Being afraid to make a sufficiently large incision on account of the proximity of the ureter and uterine artery, I dilated the smaller one and placed a loop of perforated soft rubber drainage tube through it into the abscess cavity along with some gauze packing, the ends of the tube projecting into the vagina. The case was left in care of the family physician, who, when removing the drainage, experienced a severe hemorrhage probably from the uterine artery. He had to apply several forceps to the parts to stop it. He caught the ureter also and induced a ureterovaginal fistula and an ascending infection for which I removed one kidney. The patient became entirely well afterwards and had a child even; but the case teaches much.

Although Duehrsen holds the lateral vaginal incision as eligible in cases of laterally located pelvic abscesses, I think that such incisions are very injudicious, as the above case shows, and they are unnecessary if the following *modus operandi* be followed: after

the posterior vaginal vault has been exposed by retractors to the same degree as for a vaginal hysterectomy and the posterior or both lips of the cervix uteri have been caught in a vulsellum forceps and drawn forward, an incision, never less than six centimeters long, is made transversely, from one to two centimeters back of the cervix and equidistant from the median line, through the vaginal wall into the areolar tissue beneath the peritoneum, but not into it. This should be done with a thermo-cautery because it saves blood that those feeble patients need badly. It enables one to have a dryer, clean field and often to save time otherwise required for hemostasis, and the opportunities for absorption of septic elements into new areas are much less. This wound should always be large enough to insert at least two fingers completely without stretching it. The peritoneum is opened by a finger passed along the posterior surface of the uterus between the latter and a forceps caught *pari passu* upon the loose tissues behind the finger. When the abscess to be evacuated is in the cul-de-sac it is now readily mopped out with gauze and its walls are then carefully explored with a finger for any secondary or by-pockets which are opened up, and to study the configuration of the entire cavity with reference to a complete and even packing of it. This is made with one very long and continuous strip of iodoform gauze, after the cavity has been sponged out as dry and clean as possible, usually without irrigation, unless there is absolute certainty that the general peritoneal cavity is securely walled off and that no break or defect has been made or discovered in that important wall by the previous digital exploration and manipulation. Irrigation is safe and proper in exceptional cases only, and never in the cases of the following kind: where the opened cul-de-sac, *i.e.*, opened peritoneal cavity, is merely a vestibule to a cellular tissue or ovarian abscess or a tubal sac, singly or combined, which are to be drained thus transperitoneally. Such tube sacs or laterally situated abscesses are entered with a finger assisted by a forceps and are opened into the widely opened cul-de-sac. Their cavities are likewise explored with a finger and packed very carefully and solidly with iodoform gauze, after all friable portions or septa in them have been broken down and the cavities sponged out dry with suitably curved forceps. The cul-de-sac is then also packed to procure eventually a continuous extraperitoneal channel outward, and as large or thick a wad of gauze as possible is placed through the opening in the vaginal vault into the vagina. These deeper packings are never disturbed

in less than a week's time, and when a pus tube has been packed, not until after ten days, unless a rise of temperature should indicate a retention of wound secretions in the parts. The iodoform gauze packing in the vagina, however, is renewed every two to three days. At the time of removal of the deep packings, the cavities are washed out thoroughly and then repacked more loosely. This is repeated usually once or twice at intervals of two or three days, and after that as a rule only antiseptic vaginal douches are given twice a day until the supravaginal cavities are obliterated.

DISCUSSION.

DR. EDWARD J. ILL, Newark.—The subject of vaginal drainage is one of great interest. I first began to practise it about eighteen or nineteen years ago. Therefore, what I have to say will not be because I am opposed to that particular method, but because a long experience has taught me that other ways are better. There is no question as to what should be done with cases of cellulitis or with pelvic lymphangitis of a puerperal nature. They must be opened from below if we wish to get at them, and the sooner we open them the better. It is certainly true in the other cases of tubal or ovarian abscess, or in cases of acute inflammation due to infection of the tubes and ovaries, that we get the patient well quicker by opening the cul-de-sac and allowing serous drainage, than by non-operative treatment. I have seen that demonstrated again and again.

The drainage of tubal and ovarian abscesses, however, is quite a different thing in my experience. While it may be palliative, it is by no means curative, and I have seen less dangerous results and experienced more satisfaction from putting a blister in the vagina than I have from opening the vagina and establishing serous drainage. Such a conservative man as Dr. Polk recommends and practises opening the cul-de-sac in the acute cases; but, as time has advanced, and our experience increased, we gradually have given it up. The older practitioners, those of a great many years ago, were by no means so ignorant as we are sometimes led to believe, and the old fashioned blister put in the vagina (and I think I can see some men smile when I speak of it) has saved me more annoyance and my patient more pain than anything I know of. Do not let us forget when we cut the vagina, and especially with the cautery, that we make an ugly scar, which is painful for years and years. Such scars we cannot remove. Do not let us forget the teachings of Dr. Emmet; to read his text-book to-day is a pleasure and profit to anyone. Do not let us forget when he tells us that scars anywhere in the semi-erectile tissue are productive

of a neuralgic condition, or pain. This is certainly true. These scars produce trouble only so long as the menstrual and sexual life continue. They are no longer productive of pain after the menopause or only rarely so. The cautery produces more mischief in that locality than the knife, while in all instances you leave an uneven scar by the long-continued drainage of two or three weeks and the formation of cicatricial tissue.

I want to suggest, in operations through the vagina, the avoidance of hemorrhage from the small vessels which come up from the hemorrhoidals and connect with the uterine vessels above, and which are sometimes difficult to secure. For that reason I cannot approve the suggestion of Dr. Goldspohn to cut transversely, although I do not care to argue against the method because I have never used it. A further great danger to the operation from below is the excessive hemorrhage which sometimes occurs in opening these abscesses. During a trip abroad I saw one woman, in whose case vaginal drainage was advised and resorted to for these abscesses. The operator was obliged to extirpate the uterus for a hemorrhage from an ovarian abscess which he could not control.

Dr. D. Tod Gilliam, Columbus.—Several things must be considered in connection with vaginal drainage, and the first is the cause of the trouble. Unless we have cellulitis to deal with, I do not think we are justified in resorting to vaginal drainage. The landmarks of a cellulitis are a very tense, almost iron-like condition of the vault of the vagina. If fixedness of the uterus and a board-like induration of the vaginal vault do not exist, one had better not attempt anything in the way of vaginal drainage. I do not believe, myself, in draining pus tubes. In a case of infection I am always better pleased with a knowledge of the fact that it is located in the tubes. I know then it will not go any further under ordinary conditions, because the germs are entrapped. If we get a post-partum infection through the lymphatics, it comes usually from an abrasion on one side. In that case it follows the lymphatics on one side of the uterus. It is seldom we find bilateral infection in post-partum cases.

There are a number of objections to draining pus tubes through the vagina. These have been enumerated in part by Dr. Ill. I agree with him perfectly in not using the cautery. I believe it is better not to make a transverse incision. I agree with Dr. Goldspohn, that we should not make a lateral incision, but that we should work always from the middle line outward. I have no objection to, in fact I am much in favor of, draining in cases of infection of the lymphatics or of the cellular tissue. I favor draining through the vagina where the parts are accessible. If we have to go through depths of healthy tissue or endanger parts such as the bladder or bowel, of course, I am not in favor of it.

It is a well-known fact that the worst form of germ we have to contend with is the streptococcus. This germ will live for a long time in cellular tissue, but it will sometimes spend its life

in the course of a few weeks. In other cases it will survive indefinitely. Miller, of Johns Hopkins, cites a case in which the germs were alive and active twelve years from date of infection. If we can reach this type of pus through the vagina, or in any way except through the peritoneal cavity, it is a distinct advantage. We sometimes find the abscess pointing over Poupart's ligament. If we can dissect between the peritoneum and the overlying tissues, without entering the peritoneal cavity, then we will accomplish great good, draining thoroughly in the manner indicated by Dr. Goldspohn. If the tubes are affected above we can afford to wait before making an operation. If there is good reason to act at once, we can open the abdominal cavity, but in treating tubes through a vaginal opening we are making a great mistake. Tubes should be removed and not drained. During the sexual life of the woman, as long as these parts are sterile, they will be subject to periodic, if not more frequent erections. and every time the erection of this tissue occurs there will be pain, tension and pressure, that will make the life of the woman miserable. Some of the worst forms of nervous disturbance come from this condition of the bound-down erectile tissue about the pelvis. This will cease after the menopause, unless the woman retains her sexual passion after that period, and then, of course, she will have the pains of erection after the menopause.

DR. H. W. LONGYEAR, Detroit.—The question of vaginal drainage should be more distinctly and definitely laid down. We should distinguish between those cases that are drained simply to get rid of pus in the cellular tissue, as in the cases mentioned in which there was post-partum infection, and those which come from gonorrheal infection of the tubes and ovaries. There seems to be no question about the propriety of vaginal drainage in the first-named cases. In the second, however, there is great question, and in my opinion it should only be done as a life-saving, temporary means, where a woman is *in extremis*, due to long-continued suppuration, prolonged fever and infection, when she would likely not stand a radical operation. I think these exceptional cases should be drained through the vagina, but the operation should not be advocated to take the place of the radical operation merely to prepare the patient for it, should it become necessary, at some future time.

As to the method of attacking these cases, I agree with the speakers who have preceded me, that the cautery is not the proper agent. In the first place, I think the cautery is unnecessary, as it accomplishes no more than the knife. I believe in the transverse incision made close to the cervix through the vaginal wall, and then, after the cellular tissue has been entered, in passing through with the finger and blunt forceps, into the peritoneal cavity, thence into the pus sac. This is perfectly safe, and will be free from any danger of hemorrhage. I have never seen a hemorrhage occur from opening the vagina in this way that amounted to anything, or that needed any ligature. I have seen it occur in

one case where I opened in the median line, longitudinally, and I think this will usually happen, for we will encounter blood-vessels of considerable size here—veins and arteries—from the hemorrhoidal plexus. If a transverse incision is made close to the cervix it can be made long enough to afford plenty of room, and very little hemorrhage will ensue, not enough to cause any trouble. I believe, moreover, in the use of a rubber drainage tube in these cases, as with it the drainage is more thorough and it does not cause the irritation which goes with the use of the gauze, together with the necessity for removing it. I use a large self-retaining tube.

The use of the douche inside of these pus cavities is a dangerous procedure. I never advise doing it. I believe we are in danger by so doing of pushing pus up into the peritoneal cavity, because very often it is not entirely walled off. A clean incision, a free opening of the sac with finger or forceps and introduction of rubber drainage tube completes the operation quickly. I have never seen any trouble follow this method, which was really due to insufficient drainage. It is practically without danger and there is no necessity of packing.

DR. J. HENRY CARSTENS, Detroit.—I want to emphasize what Dr. Longyear has said. The trouble is that we try to do too much. If we have a pus cavity, I believe it is a good thing to open it freely. I don't care how it is done. Cut it close to the uterus, as near as you can, and you will not be troubled with the scar that Dr. Ill speaks of.

I am really astonished at what has been said concerning iodoform gauze. I had supposed that it had long been discarded by esthetic gynecologists. Why not use a rubber tube and then give the woman a douche once or twice a day? That is all that is needful. I believe in attacking pus tubes through the vagina. This can be done in many instances. Most of the cases we drain will require secondary operations sooner or later.

DR. GOLDSPOHN (closing the discussion).—Those who observed what I said in the paper carefully, will know what my indications for drainage in tubal and ovarian abscesses are. I have not drained cases in which I have previously made a positive diagnosis of pus in a tube sac. I would always aim at radical extirpation of such. But we know we find distended cul-de-sacs occasionally, in which we are not certain in regard to their nature. We discover a pus tube with exudate about it, the result of local peritonitis with some infiltration of the cellular tissues. The woman is in a septic condition. She needs relief, and there is too much exudate to tell exactly what the tube contains. The indication is for drainage from below. We may think we have an abscess to deal with, but may find pus in the tube sac instead of the cellular tissue. Then what? Let it alone and go in from above? Not at all. I have drained and packed these tubes, expecting to do laparotomy later, but have been agreeably disappointed. For those who doubt that it is possible to obliterate a

diseased, degenerated mucous lining of an old tube sac by thorough evacuation and solid packing, I can show several cases as positive evidence for it. I do not intentionally drain the cul-de-sac for a pus tube if that be the chief or only abnormality, when I can make it out as such.

With reference to the objections that have been raised to the use of the cautery, I think if I call their attention to one thing which the speakers overlooked, they will see that their point was not well taken—namely, the proposition to drain out infectious fluid over the newly opened connective tissue spaces of a fresh wound. If made with a knife or scissors, the connective tissues for some distance about will become infiltrated, indurated, and will then undergo cicatricial contraction much more than if the septic infiltration in them had been avoided by previous closure of the connective tissue openings and lymphatics, by a small thermocautery used in making the wound. This is rather a preventive of deeper infiltration and contraction than the opposite, because if the incision is made with the knife or scissors you have everything open. There will be greater depth of infiltration of the septic process, and the cicatricial formation and contraction are much greater than would have occurred if the solution of continuity had been made with the cautery. I think this will appeal to most men as correct. I have done this so often and with such satisfactory results that the objections that have been raised to the method do not influence me at all. An incision into the vagina of two inches in length, or a little more, does not interfere with the sacro-uterine ligaments. Hemorrhage from simple incisions in the vaginal vault, from larger branches of the uterine artery that enter there posteriorly, especially, is often troublesome and harmful to feeble patients. But this is avoided by using the cautery instead of the knife or scissors, and objectionable scars or contracting indurations positively do not follow its use.

Dr. Longyear spoke of the douche as being dangerous. I practically rule out the irrigation in the operation of vaginal drainage. I almost never use it. It is not necessary. Dr. Carstens alluded to the use of iodoform gauze, saying that it was foul-smelling stuff. Unfortunately, as gynecologists, we have to deal with some ill-smelling things, and some of them are worse than iodoform gauze.

With reference to the obliteration of cavities, if the cavity is not held expanded by the packing long enough it will collapse, secondary pus pockets will form, and a new pelvic abscess may have to be evacuated, or a worse condition of the ovaries may develop inside of twelve or fourteen days. Such an indication is not fulfilled by a brief temporary drain merely, but it requires gauze packing, which should be left in for from eight to ten days. This packing must hold the walls apart, so that they cannot collapse and bring about the beginning of the process of granulation tissue building upon the walls, in order that when the pack-

ing is removed the cavity will not collapse at once, but become gradually reduced, under irrigation. If this is done, then we will secure such results as I have spoken of. By merely emptying the abscess cavity, however, and allowing it to collapse you will not obtain as good results.

DR. MURPHY.—Did I understand Dr. Goldspohn to say that the packing of a pus tube with iodoform gauze will produce destruction and obliteration of the tubal mucosa, and that then we have a condition, for instance, such as we get in appendicitis obliterans? Is that what I understand by his cases?

DR. GOLDSPOHN.—I do not believe that the mucous membrane of a pus tube is obliterated, and no longer able to make trouble by simply emptying the tube. But if it is packed and not allowed to collapse, by a foreign body in it, nature sets up a reaction against the foreign body, and this destroys the epithelium of the mucous membrane and installs granulation tissue in its place, which favors obliteration of the cavity.

SHORTENING THE ROUND LIGAMENTS BY THE BLUNT-HOOK METHOD, WITH REPORT OF CASES.

By H. W. LONGYEAR, M.D.,
DETROIT.

THE last few years have added much to the surgery of the round ligament. The desire to improve on Nature by making new ligaments, or makeshifts to act as such, has largely given way to the notion of utilizing Nature's own structures to do the work it was apparently intended they should do. The result is that we have less and less of ventro-fixation and vagino-fixation and more and more of new and ingenious devices for compelling the recalcitrant round ligament to do its duty. It seems but a short time since the general surgeon was wont to look with pity upon the searcher for so useless a thing as the round ligament. It is less than five years ago that an abdominal surgeon, who counts his cases with four figures, told the writer that he did not do the round ligament operation because he did not find any cases that needed it. Possibly that idea may have been one of the contributing elements to account for his great number of abdominal sections. To-day the great number of different devices for making the finding of the ligament easy, and of lessening its length, testifies to the fact that this structure is really of some anatomical importance and that to be up with the demands of the times the surgeon must know how to curtail its length in one way or another.

The general surgeon insists, as is his habit, on an ocular demonstration of the ligament lying at its whole length in the inguinal canal and surrounded by its proper anatomical structures; or, if his eyesight is bad, he searches for it inside the abdomen, for here he can get a view of the uterus and attached to it he is sure of finding the ligaments. To shorten them, then, is now a matter of a name. If he doubles them one way and puts in a stitch it is Dudley's method; if they are doubled the other way it is another

distinct method, and must have the author's name; if they are sewed to the back of the uterus, the front of the organ, or the loops shoved through holes in aponeurosis, the operator's name figures in each lap, fold and hole. This all goes to show that the round ligament has become a power, and that the surgeon has it on his conscience, so that now the ligament is bound to become shortened in those cases that need it, and in some others, and each surgeon will employ that method which he thinks is best suited to the needs of his patient and to his own peculiar abilities. And that, after all, about covers the ground in any matter of surgery, each operator having his own peculiar adaptability to which his work must be made to conform. The achievement of the beneficent result is the desideratum. How it is to be attained depends on the needs of the patient and the operator's skill and judgment, or, in other words, his adaptibility.

The blunt-hook operation has appealed to me because it offers the patient most for the least risk, and that, after all is said, is what we are all looking for, whether it be in stocks and bonds or in *life* that we are dealing. The details of the blunt-hook operation were given by a writer in a paper read before this Association in 1899, entitled "A Simple, Effective and Esthetic Operation for Shortening the Round Ligament," so that a brief mention of the technique will be all that is necessary at this time.

First, the location of the internal ring is determined by finding the point of crossing of Poupart's ligament and the femoral artery, as the ring is situated immediately back and above it. Beginning half an inch inside this point and cutting toward the pubic end parallel to Poupart's ligament, a one-inch incision is made through skin, fat and superficial fascia. Eye retractors and blunt hooks are then used, the tissues separated down to the aponeurosis of the external oblique, which is thus laid bare to the eye, to the extent of about one square inch. A puncture is now made through this aponeurosis, one-quarter of an inch long, situated just above Poupart's ligament and to the back of the square inch of cleared aponeurosis, and through this the blunt hook is inserted and the ligament drawn out, usually with more or less of the fat of the canal along with it. The ligament is isolated and its fibrous attachments stripped back toward the internal ring with blunt-pointed dressing forceps, the ligament drawn out to the necessary length, an aneurism needle passed through the aponeurosis and the loop of ligament drawn through this, folded back on itself, and with one stitch of kangaroo tendon made fast, the suture embrac-

NO.	AGE	OCCUPATION	BIRTHS AND MISCARRIAGES	PATHOLOGY	DATE OF OPERATION	CONVALESCENCE	ADDITIONAL OPERATIONS AT SAME TIME	LATE RESULTS	REMARKS
1	40	Housewife	1 child 13 years old; no miscarriages	Double laceration cervix, endometritis. Mobile retroversion of 3d degree	Jan. 31, 1899	Good; no suppuration	Curettage and double trachelorrhaphy	Sept. 24th, 1900. Uterus in normal condition	
2	41	Housewife	1 child 15 years old	Mobile retroversion of 2d degree and prolapse of uterus	March 8, 1899	Good; no suppuration	Curettage	Sept. 8, 1903. Uterus in anteversion	Prolapse still causes some discomfort, for which patient uses soft rubber pessary at times.
3	38	Housewife	4 children. Youngest three years; 1 miscarriage 13 years ago	Appendicitis. Endometritis. Mobile retroversion of 3d degree	March 11, 1899	Good; no suppuration	Appendectomy Curettage	Oct. 4th, 1902. Uterus in correct position in every way	Left ligament very large; shortened six inches; right ligament adherent inside of pelvis and was not shortened.
4	41	Housewife	Nullipara	Endometritis. Mobile retroversion of 2d degree	March 18, 1899	Febrile; suppuration both sides	Curettage	April 19, 1900. Uterus retroverted	At time of operation patient nearly died under anesthesia and sepsis no doubt occurred during consequent long manipulation of patient, and this doubtless caused failure of operation.
5	38	Teacher	Virgin	Endometritis. Mobile retroversion of 3d degree	March 23, 1899	Slight febrile; suppuration left side	Curettage	Dec. 29, 1902. Uterus in normal position	Did an unsuccessful vaginal fixation in 1896.
6	30	Housewife	3 children; 1 miscarriage	Ruptured perineum. Double laceration of the cervix. Endometritis. Mobile retroversion of 3d degree	March 26, 1899	Good, excepting slight stitch abscess in one groin	Perineorrhaphy, trachelorrhaphy, curettage	Feb. 2, 1900. Uterus in normal position	

7	32	Housewife	1 child. No miscarriages	Urethral caruncles at sites of ducts of Skene's glands. Mobile retroversion of senile uterus. Catarrh of same	April 13, 1899	Good; no suppuration	Thermocautery of caruncles	March 11, 1903. Her physician writes that patient is perfectly well	Senile atrophy of uterus due to oophorectomy four years before; cervix not dilatable, consequently no curettage; round ligament exceedingly attenuated.
8	31	Housewife	1 child; no miscarriages	Endometritis, mobile retroversion of 2d degree	April 14, 1899	Good; no suppuration	Curettage	Sept. 29, 1899. Uterus in perfect position, and later reports up to 1901 were that patient was perfectly well	Had used pessaries of increasing size for several years.
9	35	Housewife	4 children; no miscarriages	Mobile retroversion of 3d degree. Prolapse of 2d degree	April 12, 1899	Good; no suppuration	None	January 27, 1901. Uterus in good anteversion; Uterus still low	One year before did perineorrhaphy, curettage and vaginal fixation on this patient; hard-working woman.
10	36	Housewife	1 child; no miscarriages	Mobile retroversion of 3d degree	May 13, 1899	Good; no suppuration	None	January 26, 1903. Uterus in normal position	Patient had curettage, trachelorrhaphy and perineorrhaphy done by another physician six months previously.
11	56	Housewife	7 children; 1 miscarriage	Large hyperplastic uterus; mobile retroversion and prolapse almost of 3d degree; ruptured perineum of 2d degree; rectocele	May 24, 1899	Good; no suppuration	Curettage; perineorrhaphy	October 10, 1899. Uterus in perfect position in every way	Patient was very fat and had passed climacteric nine years.
12	36	Housewife	1 child; no miscarriages	Endometritis; double laceration of the cervix; mobile retroversion	May 26, 1899	Good; no suppuration	Curettage; trachelorrhaphy	Sept. 2, 1899. Uterus in good position	Clinical patient; did not return after last date.

NO.	AGE	OCCUPATION	BIRTHS AND MISCARRIAGES	PATHOLOGY	DATE OF OPERATION	CONVALESCENCE	ADDITIONAL OPERATIONS AT SAME TIME	LATE RESULTS	REMARKS
13	36	Housewife Widow	2 children; no miscarriages	Hyperplasia uteri; endometritis, ruptured perineum of 2d degree; mobile retroversion of 3d degree	June 20, 1899	Good; no suppuration	Curettage; perineorrhaphy	June 20, 1903. Uterus in perfect position	Patient had worn pessaries for years previous to operation and vagina was much distended because of the large sizes used.
14	32	Housewife	Nullipara	Endometritis; mobile retroversion of 2d degree	June 28, 1899	Good; no suppuration	Curettage	April 21, 1900. Uterus in normal position	
15	46	Clerk	4 children; no miscarriages	Uterine hyperplasia; mobile retroversion of 3d degree; hemorrhoids	Oct. 20, 1899	Good; no suppuration	Curettage; Whitehead's operation on hemorrhoids	Nov. 2, 1900. Uterus in normal position; has been in perfect health since	Complete invalid before operation.
16	42	Laundress	4 children; 1 miscarriage	Ruptured perineum; lacerated cervix; endometritis; mobile retroversion of 1st degree	Oct. 17, 1899	Good; no suppuration	Perineorrhaphy; trachelorrhaphy; curettage	January 10, 1900. Patient in good health; uterus in normal position	Failed to find either ligament because of the greatly relaxed condition of all the tissues, due to subinvolution.
17	33	Seamstress	6 children; 3 miscarriages	Ruptured perineum, 2d degree; lacerated cervix (left side) endometritis; mobile retroversion of 3d degree	Nov. 4, 1899	Good; no suppuration	Perineorrhaphy; trachelorrhaphy; curettage	May 2, 1900. Uterus in normal position; has gained 25 lbs.	
18	43	Housewife	Virgin	Endometritis; prolapsed normal ovary; mobile retroversion	Nov. 2, 1899	Good; no suppuration	Curettage	April 16, 1901. Uterus in normal position; ovary not troublesome	

19	45	Housewife	5 children; 1 miscarriage	Uterine hyperplasia; mobile retroversion of 3d degree	Nov. 9, 1899	Good; no suppuration	Curettage	March 5, 1902. Uterus small and in normal position; perfectly well	Had used pessaries of increasing size with the patient for eight years, till vagina was much distended and instruments ceased to hold the uterus in place.
20	41	Housewife	7 children; 2 miscarriages	Ruptured perineum; lacerated cervix (bilat.) uterine hyperplasia; mobile retroversion of 3d degree; extensive internal hemorrhoids (terrible pruritus vulvæ)	Dec. 14, 1899	Good; no suppuration	Perineorrhaphy; trachelorrhaphy; curettage; excision of hemorrhoids	Oct. 1902. Was confined in May last, by Dr. J. W. Warner. Uterus afterwards in normal position	Pruritus ceased for two months after operation, then returned and was cured permanently by intra-uterine treatments with iodine and carbolic acid.
21	38	Housewife	3 children	Uterine hyperplasia; mobile retroversion of 3d degree and prolapse; ruptured perineum of 2d degree	Jan. 8, 1900	Good; no suppuration	Perineorrhaphy; curettage	May 1, 1903. Uterus in normal position; patient has been well since operation	Lived on a ranch for two years after operation and rode horseback a good deal; constant use of pessary necessary for several years before operation.
22	36	Wife of Laborer	Nullipara	Endometritis; mobile retroversion of 2d degree	Jan. 23, 1900	Good; no suppuration	Curettage	March 27, 1900. Uterus in normal position	Clinical patient; did not return for later examination.
23	25	Housewife 4 years married	Nul; no miscarriages	Endometritis; prolapse of left ovary (normal size); retroversion of 2d degree with slight adhesions: adherent prepuce of clitoris.	Dec. 6, 1899	Good; no suppuration	Abdominal section and breaking up of adhesions; curettage, freeing of prepuce	July 13, 1903. Uterus in normal position. Dr. F. N. Henry reports: Sept. 14, 1903, confinement 1 year ago. Uterus since in normal position	Right ligament large and strong, shortened four inches; left ligament very fragile, broke inside of ring and was not regained.

NO.	AGE	OCCUPATION	BIRTHS AND MISCARRIAGES	PATHOLOGY	DATE OF OPERATION	CONVALESCENCE	ADDITIONAL OPERATIONS AT SAME TIME	LATE RESULTS	REMARKS
24	30	Housewife	Nul; no miscarriages	Endometritis; mobile retroversion of 3d degree	March 2, 1900	Good; no suppuration	Curettage	February 15, 1902. Uterus in normal position. Has been well since operation	One year before did an abdominal section and ventro-suspension which was unsuccessful.
25	27	Seamstress	Virgin	Endometritis; mobile retroversion of 2d degree; external hemorrhoids	March 21, 1900	Good; no suppuration	Curettage; excision and suturing of hemorrhoids	February 7, 1901. Uterus in good anteversion	Right ligament shortened 5 in., left 3½ in.; both slender.
26	30	Housewife	1 child (still born)	Endometritis; prolapse left ovary; retroversion of 3d degree, not very readily replaced; slight adhesions	March 22, 1900	Good; no suppuration	Curettage	October 18, 1900. Uterus is slightly retroverted and patient feels pulling sensation in right groin	Patient was confined of a dead child (2d) 1902, since which Dr. Florence Huson reports uterus in normal position.
27	37	Housewife	2 children; no miscarriages	Endometritis; lacerated cervix; rectocele; mobile retroversion	April 5, 1900	Slightly febrile left ligament suppurated	Curettage; trachelorrhaphy; perineorrhaphy, posterior colporrhaphy	May 1, 1902. Uterus in normal position	Made an unsuccessful vaginal fixation in 1895.
28	36	Housewife	1 child; no miscarriages	Ruptured perineum of 2d degree; ovaries prolapsed (normal size); uterus retroverted and not very easily replaced	April 21, 1900	Good; no suppuration	Curettage; perineorrhaphy	Feb. 26, 1901. Uterus in first degree of retroversion; pain and pulling in both scars	Patient was treated with ichthyol and glycerine tampons for three months before operation, so that uterus was fairly mobile at that time; slight adhesions apparently remained to prevent entire success of the operation.

29	39	Stenographer	Virgin	Prolapse of sensitive, but not enlarged, tubes and ovaries; not freely mobile; retroverted uterus of 3d degree	May 24, 1900	Good: no suppuration	Curettage	January 31, 1903. Uterus in retroversion without instrument. Operation a failure except in enabling the use of pessary, which was not borne before	This patient should have had an abdominal section, but feared it because of an organic heart trouble.
30	33	Housewife	2 children; 1 miscarriage	Ruptured perineum of 2d degree; lacerated cervix (bilateral); uterus retroverted 2d degree	June 30, 1900	A febrile, slight suppuration in left ligament	Perineorrhaphy, trachelorrhaphy; curettage	Jan. 20, 1901. Uterus in normal position, but dragging pains are felt in both groins Feb. 27, 1903. Uterus retroverted and partially fixed, catarrhal appendicitis July 2, 1903. Uterus in normal position	Had an abortion with streptococcic infection causing phlegmasia six years before ligament operation.—March 5, 1903, abdominal section, appendectomy and removal of outer extremities of Fallopian tubes, which were strongly adherent to rectum, and posterior wall of pelvis at fimbriated ends; tubes not enlarged or diseased, but much attenuated by stretching. Round ligaments taut.

NO.	AGE	OCCUPATION	BIRTHS AND MISCARRIAGES	PATHOLOGY	DATE OF OPERATION	CONVALESCENCE	ADDITIONAL OPERATIONS AT SAME TIME	LATE RESULTS	REMARKS
31	25	Housewife	Nullipara	Mobile retroversion of 2d degree; hyperplasia uteri; pruritus vulvæ and masturbation of long standing	Nov. 17, 1900	Good; no suppuration	Curettage; dilatation of sphincter ani	Pruritus relieved for three months after operation, when it returned around anus; masturbation refrained from till then, when it was again resumed; uterus in good position till May 24, 1901, when she sought other advice, pruritus and masturbation continuing	A masturbator, apparently as the result of the pruritus; married; childless, due to closure of seminal ducts in husband.
32	40	Laundress	4 children	Ruptured perineum of 2d degree; lacerated cervix, bilateral; endometritis; mobile retroversion of 3d degree	Nov. 24, 1900	Good; no suppuration	Perineorrhaphy; trachelorrhaphy; curettage	March 2, 1901. Uterus in normal position; patient lost sight of after this	
33	26	Housewife	2 children	Ruptured perineum of 2d degree; endometritis; mobile retroversion of 2d degree	Dec. 15, 1900	A febrile, but slight suppuration in right ligament	Perineorrhaphy; curettage	March 29, 1901. Uterus in normal position; patient did not return afterwards	

34	28	Housewife	Nullipara	Endometritis; mobile retroversion of 2d degree	Jan. 4, 1901	Good; no suppuration	Curettage	Feb. 2, 1903. Uterus in normal position; patient has since reported several times that she is perfectly well	Several years previously had been operated on for appendicitis and tubal abscess; had been obliged to wear many sizes of pessaries.
35	46	Housewife	1 child; 1 miscarriage	Ruptured perineum of 2d degree; bilateral lacerated cervix; uterine hyperplasia; mobile retroversion of 3d degree	Jan. 24, 1901	Febrile due to pleurisy; union of wounds perfect	Perineorrhaphy; trachelorrhaphy; curettage	April 21, 1903. Uterus in perfect condition and position	Was practically an invalid before operation, being bedridden most of the time.
36	26	Housewife	Nullipara	Endometritis retroversion	Feb. 23, 1901	Good; no suppuration	Curettage	April 3, 1903. Uterus in normal position	
37	30	Housewife	3 children	Ruptured perineum of 2d degree; subinvolution	Feb. 25, 1901	Good; no suppuration	Perineorrhaphy; curettage	Jan. 27, 1902. Patient's physician reported by letter that she was well except for a mild menorrhagia; uterus in normal position	At time of operation the dilator made a rent in the cervix so that the finger could be passed into the broad ligament; was a "bleeder," perineum and uterus oozing blood for a week after operation.
38	29	Housewife	3 children; 2 miscarriages	Ruptured perineum of 2d degree; unilateral laceration of cervix; uterine hyperplasia; mobile retroversion of 3d degree	May 10, 1901	Good; no suppuration	Perineorrhaphy; trachelorrhaphy; curettage	April 9, 1903. Uterus in good position	Had a miscarriage with sepsis in November, 1902, and soon after recovery uterus was inclined to retrovert, but recovered. Ligaments shortened seven or eight inches.
39	29	Nurse	Virgin	Mobile retroversion; prolapsed ovary	June 10, 1901	Good; no suppuration	Curettage	Jan. 3, 1903. Patient's physician reported uterus in perfect position	Prolapsed ovary removed by her physician six months after ligament operation.

NO.	AGE	OCCUPATION	BIRTHS AND MISCARRIAGES	PATHOLOGY	DATE OF OPERATION	CONVALESCENCE	ADDITIONAL OPERATIONS AT SAME TIME	LATE RESULTS	REMARKS
40	27	House-maid	Virgin	Endometritis; mobile retroversion of 2d degree	Jan. 9, 1901	Good; no suppuration	Curettage	Feb. 3, 1902. Uterus in good position	
41	41	Housewife	2 children, 2 miscarriages	Ruptured perineum of 2d degree; rectocele; lacerated cervix (bilat.); endometritis; mobile retroversion 3d degree	Oct. 14, 1901	Good; no suppuration	Perineorrhaphy, trachelorrhaphy; curettage	April 11, 1902. Uterus in normal position	Had worn many pessaries.
42	34	Housewife	1 child	Ruptured sphincter ani (incomplete) result of previous perineorrhaphy; mobile retroversion of 3d degree	Oct. 27, 1901	Good; no suppuration	Perineorrhaphy	December, 1902. Uterus in normal position and all symptoms relieved	Left ligament only shortened; right very fragile and would not run through internal ring.
43	26	Housewife	Nullipara	Appendicitis; mobile retroversion of 2d degree	Nov. 7, 1901	Slight suppuration in right ligament.	Appendectomy; curettage	Not seen since leaving hospital; family physician reports uterus is in normal position May, 1902	
44	28	Housewife	2 children	Ruptured perineum of 2d degree; lacerated cervix (bil.); endometritis	Nov. 16, 1901	Febrile; streptococcic infect'n of both ligaments; other parts healed by 1st intention	Perineorrhaphy; trachelorraphy; curettage	Sept. 14, 1903. Uterus in perfect position and condition	Remarkable that the streptococcic infection did not interfere with the good result of ligament operations.
45	33	Housewife	1 child	Ruptured perineum of 2d degree; lacerated cervix; mobile retroversion of 3d degree	Jan. 13, 1902	Good; no suppuration	Perineorrhaphy; trachelorrhaphy; curettage	May 2, 1903. Uterus in good position	

46	38	Housewife	2 children; 1 miscarriage	Ruptured perineum of 2d degree; unilat. lacerated cervix; endometritis; mobile retroversion of 3d degree	Jan. 30, 1902	Slight suppuration in right side	Perineorrhaphy; trachelorrhaphy; curettage	Sept. 19, 1903. Dr. Huson reports uterus in normal position	Patient of Dr. Florence Huson, who performed the additional operations.
47	29	Housewife	Nullipara	Endometritis, mobile retroversion of 2d degree	Feb. 5, 1902	Slight suppuration 3 weeks afterwards	Curettage	July 1, 1902. Uterus in normal position	
48	37	Housewife	3 children	Ruptured perineum of 2d degree; lacerated cervix (bilat.); endometritis	Feb. 29, 1902	Slight suppuration in right side	Perineorrhaphy; trachelorrhaphy; curettage	Sept. 25, 1902. Uterus in normal position	
49	36	Laundress	3 children	Ruptured perineum of 2d degree; bilateral laceration of cervix; mobile retroversion of uterus of 3d degree	March 22, 1902	Slight suppuration in left ligament	Perineorrhaphy; trachelorrhaphy; curettage	May 3, 1903. Uterus in normal position	
50	37	Housewife	5 children	Ruptured perineum of 2d degree; unilateral lacerated cervix; mobile retroversion of uterus of 3d degree	April 16, 1902	Good; no suppuration	Perineorrhaphy; trachelorrhaphy; curettage	Sept. 13, 1902. Uterus in normal position; later reports from her physician are to the same effect	Began to use gloves with this case.
51	28	Housewife	3 children; 1 miscarriage	Ruptured perineum of 2d degree; endometritis	May 10, 1902	Good; no suppuration	Perineorrhaphy; curettage	Confined by Dr. H. W. Yates, who reports, Sept. 18, 1903, uterus in normal position	
52	46	Hard-working woman	5 children	Ruptured perineum of 2d degree; bi-lateral lacerated cervix with cicatricial hypertrophy of anterior ligs.; retroversion and complete procidentia; severe pruritus	Oct. 4, 1902	Good; no suppuration	Perineorrhaphy; trachelorrhaphy and amputation of anterior lip of cervix; curettage	Feb. 19, 1903. Uterus in normal position, though patient is working hard and has had a severe cough for two weeks Sept. 18, 1903. Uterus still in normal position	Round ligaments very thick and strong; uterus had been outside for about a year.

NO.	AGE	OCCUPATION	BIRTHS AND MISCARRIAGES	PATHOLOGY	DATE OF OPERATION	CONVALESCENCE	ADDITIONAL OPERATIONS AT SAME TIME	LATE RESULTS	REMARKS
53	20	Factory girl	Virgin	Prolapse of both ovaries (normal); mobile retroversion of 2d degree	Oct. 29, 1902	Good; no suppuration	Curettage	Jan. 25, 1903. Uterus in normal position; ovaries still prolapsed and somewhat irritable	Left ligament only shortened; right not found.
54	24	Housewife	Virgin	Endometritis; retroversion of 2d degree	May 24, 1903	Good; no suppuration	Curettage	Sept. 15, 1903. Uterus in good position	
55	28	Housewife	1 child	Ruptured perineum of 1st degree; bilateral lacerated cervix; prolapse of ovaries, retroversion of 2d degree	April 22, 1903	Good; no suppuration	Perineorrhaphy; trachelorrhaphy; curettage	June 12, 1903. Result apparently ideal; patient left city	
56	28	Teacher	Virgin	Adhesions of prepuce of clitoris; retroversion of 3d degree	April 25, 1903	Febrile; suppuration left ligament	Curettage; freeing of prepuce of clitoris	July 2, 1903. Uterus in good position; not seen since	Rubber gloves of assistant badly torn at beginning of operation.
57	28	Housewife	Nullipara	Endometritis; mobile retroversion of 2d degree	May 9, 1903	Good; no suppuration	Curettage	July 6, 1903. Uterus in normal position	
58	27	Housewife	1 child; 5 miscarriages	Lacerated cervix (left); endometritis; mobile retroversion of 3d degree	May 26, 1903	Good; no suppuration	Trachelorrhaphy; curettage	July 2, 1903. Uterus in good position; not seen since, but her physician reports result perfect	

ing in its grasp the edge of the aponeurosis where the ligament first passes through it, half of the ligament at the same point and half on each side of the loop that is folded back on it. The skin is then closed by a running catgut suture and dressings applied. The operation is applicable only in cases of mobile uteri without diseased appendages—in which cases it is an ideal procedure—or in cases in which adhesions may have been previously broken up by abdominal section.

A number of devices have been resorted to for the purpose of catching the ligaments and suturing them through the abdominal incision and thus avoiding the making of the secondary operations in the groins, but they cannot expect to equal the method which leaves the shortened ligament in exactly its normal position.

Dr. Noble is the most recent aspirant to fame in this direction, and his method of picking up the ligament at the end of a cross-cut in the abdominal wall seems rather good, as it nears the ideal method. By only making the ends of his cross-cut and using the blunt hook he would about have the method described in this paper.

The following tabulated record shows the results of this operation in the hands of the writer up to date:

Total number of cases, 58.

Cases in which late examination has shown uterus to be in normal position, 48.

Cases which showed uterus in normal position two to five months after operation and were then lost sight of, 6.

Partial failure, 1.

Complete failure, 2.

Uterus held in normal position when but one ligament was shortened (total number of such cases), 3.

Failure to find either ligament, 1.

Failure to find more than one ligament, 1.

Confinement after operation and uterus remaining normal afterwards (total number of confinements), 3.

Uterus retroverting late after operation, caused by new adhesions and relieved by breaking up adhesions through abdominal incision, 1.

The total additional operations performed at the same time as the Alexander operation were as follows:

Perineorrhaphy, 24; trachelorrhaphy, 20; curettage, 53; abdominal section, 3; operation on hemorrhoids, 3; freeing of pre-

puce of clitoris, 2; amputation of cervix, 1; posterior colporrhaphy, 1; cautery of caruncles, 1.

The interior of the uterus is examined with the curette in all cases that have not been previously, at a recent date, curetted, Occasionally a curettage is not necessary, but usually the uterus which has remained in retroversion for some time will be found to contain more or less degenerated mucosa.

The one case of failure to find both ligaments was one of subinvolution and the tissues composing the abdominal wall were so flabby and relaxed that all landmarks were distorted. The aponeurosis of the external oblique was so loose and flabby, that it could be drawn up through the incision like a piece of wet linen. Later operation was intended but examination then showed the uterus to have righted itself with the progress of involution.

Before the writer acquired the habit of wearing gloves in this operation, several cases of suppuration occurred, and it is remarkable that but one of them seemed to influence the good result of the operation.

Case 52 was one of complete prolapse, and thus far appears to be a complete cure. The additional plastic operations no doubt contributed largely to the result, but these alone would not have sufficed without the anterior restraining force on the fundus to throw the axis of the uterus across that of the outlet of the vagina.

Case 30, the one in which the uterus retroverted late because of new adhesions, is of interest because it shows the lasting effects of the shortening of the ligaments, they being found to perform their office perfectly as soon as the adhesions were broken up, and they still continue to hold the uterus in anteversion.

Case 4, the first one of complete failure, was doubtless the result of a severe suppurative inflammation, which continued for over two weeks after the operation, during which time the ligaments probably slipped back to their original position. The infection was the result of much handling of the patient incident to collapse from anæsthesia.

The second complete failure, Case 29, was badly selected, as some adhesions were recognized to be present previous to operation, but the patient having an organic heart affection, and consequently fearing an abdominal operation, I was prevailed on to try shortening the ligaments after a preliminary course of treatment.

The case of partial failure, No. 28, was also caused by adhe-

sions, and should have had a section previous to the Alexander operation.

A large number of these cases were old patients that I had known and treated for years before operation, many of them having been under my care while I was practising general medicine, so that I have been able to observe them more closely than is usually possible in the ordinary clinical cases. The relief from the symptoms caused by the displacement, and—often of equal gratification to the patient—the freedom from the presence of the annoying pessary, have been exceedingly gratifying to both patients and surgeon.

DISCUSSION.

DR. EDWARD J. ILL, Newark.—I desire simply to ask the essayist one or two questions. When Dr. Longyear read a paper a few years ago on this subject I was very much impressed with his description of the method employed. I have done the operation twelve or fifteen times, and I do not think there is a nicer operation in the whole line of work than the one which he has described, but difficulty has arisen afterward. While the patients have remained well, so far as the retrodisplaced uterus was concerned, a painful scar has been a notable factor; also pain at the round ligaments, especially in patients who were not stout. After operating on the first few patients I wrote Dr. Longyear about this, and I tried to follow his suggestions in regard to the painful round ligament, and when he closes the discussion I would like to know what explanation he has to offer.

DR. ALBERT GOLDSPOHN, Chicago.—I did about one hundred of the simple Alexander operations, and proceeded upon the plan of not opening the peritoneal cavity most of the time, although sometimes it was opened, even before I developed my more thorough method, which I have employed in several times as many cases during the past ten years.

The objections to the simple Alexander operation are that it is not thorough, that it does not fulfil all the indications; it leaves the operator blind to the end of his operation not only in regard to the exact condition before the operation but as to the conditions after he gets through with it. If we had operated twenty-five years ago, when the dangers of sepsis were greater than now, then these things would be sufficiently important to rule us out from opening the peritoneum; that is to say, we should be satisfied, and not take any more serious chances by opening the peritoneal cavity. The opening of the peritoneal cavity in these days, however, is as innocent as making a hernia wound. It is to me incomprehensible how an intelligent man who works down to the

peritoneum and, as a rule, tears a little hole in it (for if he shortens the round ligaments by the Alexander operation appreciably, he does tear a small hole in the peritoneum) should have such fear of entering the peritoneum. He can just as well introduce a finger, find out the exact state of things, liberate obscure adhesions and detach the round ligament sufficiently from its entanglement in the broad ligament. The simple cases do not need operation badly, for they can be treated by pessaries; but in about every fifth individual ligament that we shorten in the simple class of cases we will find that when we have it seemingly well drawn out and then pull upon it, we scarcely make an impression upon the position of the uterus. This is because we pull not from the uterus but from the broad ligament about midway between the uterus and the pelvic wall, and such traction of the round ligament is very likely to allow retroversion to recur, especially if there is also elongation of the sacro-uterine ligaments. This accounts for many recurrences in the work of Kellogg in making light of this operation.

In several cases the essayist did not find the round ligaments at all on either side. I am not surprised at this, considering the method he employs. A small wound is made over the lateral ring. The ligament is enveloped in muscular tissue; and if the least pathology has existed in the tissues recently or remotely there will be difficulty in dissecting the ligament out from the internal oblique and transversalis muscles. The relapse of the cases of retroversion, two complete and one partial, are simply the natural outcome of that kind of work, rather than failure from suppuration. I have not seen any suppuration from my method of operating on these cases for two years, but before I used gloves, occasionally I did. I was very greatly surprised in not getting a single return of the retroversion in the worst suppurative cases with which I had to contend,—a fact which was confirmed by a subsequent examination of the women.

DR. D. TOD GILLIAM, Columbus.—Some years ago I went to see Dr. Kellogg operate and to have him demonstrate his operation to me. After seeing it, I thought it was one of the prettiest operations I had ever witnessed. I went back home very much enthused, and in all my operations for retroversion of the uterus, for some time, I employed the Kellogg method. I had some difficulty in finding the ligament, sometimes failing to find it either on one side or the other. I had some suppuration to deal with and I encountered difficulties of various kinds. I wrote to Dr. Kellogg and received a lengthy letter from him, stating that I must not be discouraged in not finding the ligament, as it took him two years to find it. Furthermore, he said a celebrated surgeon from the East came to see him and to witness his operations. He went back and drew up the femoral vein thirteen times thinking he had the ligament. I mentioned this incident once before, and Dr. Ross, of Toronto, a Fellow of this Association, questioned it. It is a difficult operation for a man who is not schooled to

it. After a man has become familiar with it, it is an easy operation.

A very intelligent lady once consulted me, after a visit to Dr. Kellogg, who wanted to shorten her round ligaments by his method. I made a vaginal examination, but could not discover anything special. I therefore made an abdominal section, and found old inherent atrophied tubes and ovaries. The uterus could be tipped forward by lifting up the cul-de-sac. It was one of the most difficult operations I have ever done to relieve such tubes and ovaries. In a number of cases in which I have done my own operation, for simple as well as complicated cases, I have encountered complications that I did not suspect, and in a number of cases I found tuberculosis; so you see we do not always gain much by not opening the abdominal cavity. Before the days of antisepsis it was a question as to whether we should do this or not, but since the advent of antisepsis and asepsis there is no greater danger in opening the abdominal cavity than there is in pulling out the ligaments and tearing the peritoneum through the two openings made in doing this operation. To anyone who is schooled in the Kellogg method, when there are no internal complications I should say, let him do it, for to such it is a fine method; but anyone who is not satisfied that there are no internal complications, and who is not expert in this operation, should open the peritoneal cavity and see what he has to deal with.

Dr. Lewis S. McMurtry, Louisville.—I have listened to Dr. Longyear's papers upon this subject on previous occasions and I think he is in danger of being misunderstood largely on account of the title of his paper. We find that in very few of the cases he has reported this morning the Alexander operation, pure and simple, was done; and if his paper had been entitled "Minor Surgery in the Restoration of the Retroverted Uterus to its Normal Position," it would perhaps have been more definite. A number of these cases had other operations performed on them coincidentally with the Alexander operation. For example, in a number of cases he did perineorrhaphy. I believe in most of them he did curettage. In others he did trachelorrhaphy. In some he performed abdominal section conjointly with this operation. Dr. Longyear's investigations have been very carefully made, and he has followed up the subject from year to year. I think he will tell us in closing the discussion that his estimate of the operation *per se* is much less now than it was in 1899, when he prepared an exhaustive paper on the subject.

Early in my experience I did a number of these operations, and observation of the cases persuaded me that the operation was of very little value in itself. In the larger proportion of these cases, it is perferable to open the peritoneal cavity and know just exactly the cause of the displacement of the uterus, and the knowledge derived therefrom is essential. In virginal women there is often found a simple dislocation of the uterus,

without adhesions and without apparently any pathological condition in the uterus itself. But when we exclude the virginal class, there are very few cases in which a displacement of the uterus is a simple thing. In almost every instance there is some pathological condition in the uterus itself, or of the uterine appendages, and the mere correction of the displacement is but a small part of what is necessary to be done by the surgeon; and I think as we get a larger experience, as Alexander himself has done, we shall see that the scope of this operation is very much less than it is generally reported to be. The number of cases in which it will succeed and permanently relieve is limited. It is easy of performance; it does not open the abdomen, and practically has no mortality; so that it was naturally the resort of surgeons, speaking generally, who feared to open the peritoneal cavity.

DR. LONGYEAR (closing the discussion).—Dr. Ill spoke of the scar causing discomfort. In my tabulated report you will see two or three cases in which that symptom is mentioned. It does occur in rare instances and is usually caused by fixing the ligaments at too great tension, or possibly, some slight adhesion may exist that has not been discovered.

DR. ILL.—Sometimes the pain is produced by the clothing of the patient pressing on the scar.

DR. LONGYEAR.—In that event, it must be due to the formation of excessive scar tissue. I have seen an abdominal wound where a slight keloid formation takes place, and it is tender to the touch. In thin subjects one can readily feel a bridge when the ligament is folded up, for some time, and this at first is sensitive, but it passes off sooner or later, and after a few months there will be no tenderness.

Dr. Goldspohn spoke of the necessity of opening the abdomen in these cases, as we could not know otherwise what the condition was inside. Of course, if you cannot make a diagnosis without entering the abdomen, then open the peritoneal cavity, but I do not think it is always necessary. We have the simple cases alluded to by Dr. McMurtry, in which there are no internal complications or adhesions.

DR. GOLDSPOHN.—You can make the diagnosis so far as the gross position of the uterus is concerned, but no man can tell how far the round ligament can be stripped out of the peritoneal cavity by operation.

DR. LONGYEAR.—If there are adhesions you cannot strip it out, but you can usually make that diagnosis beforehand. The cases are very exceptional in which you cannot tell that there are such adhesions when they are present. As to whether we tear the peritoneum or not in stripping out this ligament, I think it is largely problematical. I do not think Dr. Goldspohn has ever discovered that he entered the peritoneal cavity that way. If he did so, he must have made a much more extensive dissection than is necessary by the operation I am speaking of.

What Dr. Gilliam said proves the individual adaptability to this operation, as well as to most others we do. Some of the best abdominal surgeons of this country do not do this operation. They not only do not do this one, but similar operations of a fine plastic character. They are not adapted to that kind of work and so do not like it, and for that reason they do something else instead, which they try to believe is equally good.

I am glad that Dr. McMurtry referred to the additional operations that were made in connection with the Alexander operation, and I agree with him in the main with reference to these additional operations, as they are almost always necessary to effect a complete cure. Dr. Goldspohn, likewise, at the same time he shortens the ligaments does other operative work through the inguinal opening; and so with this operation, we should do everything else that is necessary to put the woman in a healthy condition, and to do this it is requisite that her organs shall all be replaced in their proper position. Some of these additional operations are necessary in almost all these conditions in women who have borne children. I look upon the shortening of the round ligaments as simply what we might call the keystone to the arch of this, so frequently neglected, plastic, reconstructive work. If you do not do the additional operations indicated in these cases, besides the Alexander operation, you do not effect a cure, but by adding them to the round ligament operation you bring about a complete cure, which is likely to be permanent because the organs and tissues are placed back in their normal position.

EXHIBITION OF SPECIMENS.

By X. O. WERDER, M.D.,
PITTSBURG.

First specimen: *A large mass made up of wood fibers, removed from the stomach by gastrotomy.* Mrs. S., thirty years old, mother of two children, had been complaining for several years with gastric disturbances and neurasthenic symptoms. For several months she had noticed

Foreign body from stomach. Front view.

a "lump" in her left epigastric region which, during deep inspiration, could be palpated on the left side of the abdomen in the region of the umbilicus. In the recumbent position the mass would recede under the left arch of the ribs, where only the lower margin could be felt, excepting during deep inspira-

tion. The mass was freely movable under the fingers, was not sensitive, and had the shape of an enlarged, movable kidney.

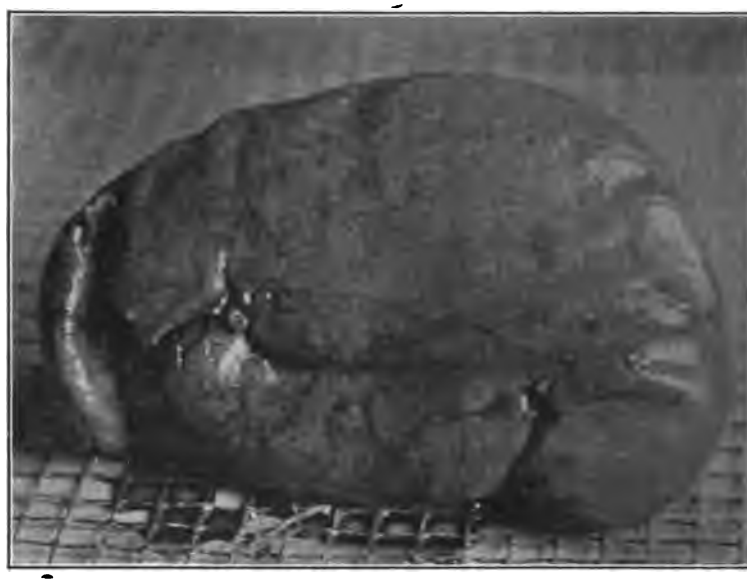
The abdomen was opened June 24, 1903, in the median line above the umbilicus. The neoplasm was found connected with the stomach, and examination showed it to be contained loose and free in the cavity of that organ. The anterior surface of the stomach was freely laid open, the incision extending horizontally almost the entire length of the viscus. A large, firm, solid mass was removed, weighing eighteen ounces, which has the exact shape of the interior of the stomach when moderately distended. The cardiac and pyloric ends are particularly well outlined.

Torsion of spleen.

On section, the entire mass was found to consist of wood fibers of different sizes and lengths, partially softened by mastication. Most of the fibers are in bundles, the size of a pin, and about half an inch long. In addition, there is some granular débris, with a few (disintegrated) epithelial cells and some altered starch granules. As an explanation of the presence of this unique tumor in the stomach, it was learned that in her earlier days she had been an inveterate chewer, and that she was in the habit of chewing large quantities of licorice root. The patient made an excellent recovery, and is much improved in her health.

Second specimen: *Displaced spleen, which had given rise to intestinal obstruction.* Mrs. B. was admitted to Mercy Hospital,

June 6, 1903, with the history of having been confined to bed for two weeks with severe pains in her abdomen, vomiting and obstinate constipation. It was impossible to obtain a more detailed history, as she was unable to speak English. Her pulse on admission was rapid and feeble, abdomen distended, and in the right iliac region extending from the border of the ribs down to Poupart's ligament and one to two inches to the left of the median line, was a firm, elastic tender tumor. Her condition rapidly grew more serious, and on the third day fecal vomiting made immediate operative intervention necessary.



Torsion of spleen. Top view.

A pelvic examination showed no connection between the pelvic organs and this tumor. Her abdomen was opened in the median line and a dark, smooth-surfaced tumor was found filling the greater portion of the right anterior abdominal cavity. The entire anterior surface was adherent to the abdominal wall, and in separating the adhesions the fingers broke into the tumor, which seemed to be filled with large quantities of organized blood-clots. and it was at first thought that the tumor was an immense hematocele. Closer inspection, however, showed the consistency much firmer than a blood-clot, and on further exploration an attachment was found in the left hypogastrium. The tumor proved to be the

spleen, much enlarged and engorged. A loop of transverse colon was found adherent in the splenic fissure, but completely collapsed and empty. The pedicle, which was long and thin with considerable tension, was ligated and the strangulated spleen delivered. The collapsed bowel at once began to fill up and distend. The patient's condition was extremely serious, and the operation had to be hastened to such an extent that a more careful exploration of the abdominal cavity was out of the question.

She gradually rallied and in a few hours there was very free bowel movement, which continued during the next forty-eight hours. During the third day her temperature rose to 105°, she became very delirious, could with difficulty be restrained, and on the fifth day she went into collapse and died. Her abdomen after the first thirty-six hours was perfectly flat.

The spleen weighed 12½ pounds, and measured transversely 8½ inches (21.5 cm.), 4½ inches thick and 5½ inches (14 cm.) vertical measurement. Whether the intestinal obstruction was due to the adhesions and compression of the lumen of the colon engaged in the fissure, or to a twist or kink higher up, could not be learned, as the patient's condition did not permit of a more careful investigation of the abdominal cavity at the time of the operation.

JAMES F. BALDWIN, M.D.,

COLUMBUS.

First specimen: *Tubal pregnancy, with primary rupture after four and one-half months' gestation.* Mrs. H., aged thirty-five years; married nineteen years; occupation, actress; number of children, six; age of youngest, seven; character of labor, normal; one miscarriage at five months, six years ago; no particular trouble. The patient menstruated during the last week in February; noticed a tenderness of the breasts the latter part of March; had no morning sickness. April 12th she noticed a dribbling of blood; this dribbling continued for about three months and only ceased a few days ago. About once a month, during this time, she had what she supposed was a monthly period, which was accompanied with more or less severe pain in the pelvis. Once or twice these pains were severe enough to confine her to bed for a short time. Between them she felt fairly well, but not quite herself.

On the evening of July 13th, after completing her work at the theatre, and while dressing preparatory to going home, she was seized with the most intense "agony." She did not faint, however, but suffered such pain that a physician was called, who at once sent her to the hospital. She is positive that she had felt

Four and one-half months' tubal gestation. Note caput succedaneum.

motion during the week preceding her coming to the hospital. According to this history, therefore, she was pregnant fully four and a half months. She had noticed a lump in the abdomen, low down on the left side, about a week ago. This had increased steadily in size since she first observed it. July 14 I first saw her at the hospital. Her pulse was good and she had good color.

Examination showed the uterus pushed well over to the right by a cystic mass behind it and to the left. This mass filled the cul-de-sac and extended as high as the crest of the ileum; was quite tender. The diagnosis of tubal pregnancy was at once made, but, as her condition was good it was decided to prepare her more thoroughly for an operation, and to operate the next morning.

July 15. The abdominal cavity was opened, and the conditions accompanying ruptured ectopic pregnancy were at once found,

Enormous gall-stones. Exact size.

Enormous gall-stone. Exact size.

but the amount of free blood was small. The fetal sac, which consisted of the greatly distended tube, was removed without much difficulty. The rupture was in the free portion of the tube, and into this the head of the fetus had been wedged. The tube had contracted adhesions to the adjacent parts so that there was some oozing of blood in separating it, but this was controlled without special difficulty. The ovary was intimately adherent to the tube and was removed with it. The right tube, which showed the remains of a former salpingitis, was also removed; both tubes being

excised well into the horn of the uterus. The right ovary was healthy and was not disturbed. The uterus itself was considerably enlarged, with the characteristic softening of pregnancy. Patient made an absolutely uneventful recovery.

Examination of the specimen showed it to be of not less than four and a half months' gestation. The head of the fetus, which had plugged the opening in the tube, shows a distinct caput succedaneum. It was this plugging of the rent which doubtless prevented severe hemorrhage.

Second specimen: *Gallstones.* The patient from whom these stones were removed was a woman fifty-nine years old. The operation was performed March 30, 1901, for the removal of an ovarian cyst, estimated to weigh about sixty pounds. At the operation, after removing the cyst, the uterus was found retroverted, with a fibroid in its anterior wall. This fibroid was therefore removed and the uterus suspended. The gallstones were then found and removed through a separate incision. Patient made an uneventful recovery. The size of the stones is exactly shown in the cut. Their weights were, respectively 3 drams, 5 drams, and 10 drams.

JOHN YOUNG BROWN, M.D.,

ST. LOUIS.

Intestine showing perforations. The patient from whom the specimen was removed (post-mortem) was admitted to the hospital suffering from a gunshot wound of the abdomen. The case was operated upon by my first assistant, Dr. Walter Kirchner. On section, fourteen perforations were found. Six inches of bowel were resected and anastomosis made with a Murphy button. Lower down a section of small bowel two feet long was resected, anastomosis being made with a Connell suture. The Murphy button passed on the nineteenth day; the patient died of hemorrhage from the lungs twenty-three days after operation.

The special point of interest in this case was the fact that the Murphy button readily passed the Connell suture. The specimen shows that the surgery in the case was perfect. I will ask you to note the line of union at the Murphy button anastomosis. The contrast in the union here and the union at the Connell suture is marked. I have never observed a more beauti-

ful result than is seen at the point of union made by the button. I do not desire to discuss the relative merits of the Connell suture and Murphy button as methods of anastomosis. I, however, will state that I believe that in gunshot work the button is the ideal method of approximating bowel. In these cases time is a factor. There may be men who can put in a Connell suture as rapidly as they can a Murphy button, but I cannot do it. The specimen speaks for itself. A similar case to this one was reported by Dr. Louis Rassieur, formerly my first assistant.

C. C. FREDERICK, M.D.,
BUFFALO.

Large Fallopian tubes. I have here two speciments that are interesting. I brought them simply because I have not observed Fallopian tubes as large as these in any clinic where I have seen tubes removed. These tubes were removed from a patient who had tubercular peritonitis, and who was operated on six weeks ago. I have not opened them. The tube on the left side, before it had contracted by being put in formalin solution, was ten and one-half inches long and nine and one-half inches in circumference, while the right tube was eight and one-half inches long and seven and one-half inches in circumference, at the widest point. Some of you may have seen larger ones. They were non-adherent. The whole peritoneum was in a state of tubercular peritonitis with beginning effusion. The patient is well, with no recurrence of ascites, and may be looked upon as an example of one of the cures from tubercular peritonitis.

D. TOD GILLIAM, M.D.,
COLUMBUS.

Pathological specimen of resected stomach for malignant disease. This specimen represents sarcoma of the stomach. It has not been examined microscopically, consequently I can only infer its nature from the clinical features. That it is malignant I am morally certain. As you will see it represents a large portion of the organ and involves the pylorus and lower half of the stomach.

The case has a unique history. The patient, a woman of 62 years, came to my office in the latter part of June, 1903, and upon examination I found a mass in the region of the umbilicus which I suspected to be cancerous and gave her a permit to the hospital upon which I wrote, "for exploration." Some weeks afterward, or about Aug. 1 (when I had forgotten all about the case) she was brought into the operating room with other patients and, supposing it to be a cancer of the omentum, as I discovered, I made an opening below the umbilicus, put in my hand and drew out the stomach. I determined to perform a resection and, as the organ could be manipulated quite easily through the incision already made, concluded to operate from below the umbilicus. It was attached by adhesions to the transverse colon for a distance of five inches. I separated the adhesions (the part should have been resected) tied off the omentum, applied clamps, and resected the diseased portion. I then made an end-to-end anastomosis of stomach to duodenum, using the silk suture.

She was not greatly shocked and on the second day I began rectal enemata of a saline solution. On the fourth day she was given nourishment per rectum and teaspoonfuls of albumen water per os every hour. On the fifth day she was allowed to go home at the earnest solicitation of friends and a nurse who promised to look after her. She had developed a cheerful mania before leaving the hospital, which was not recognized as such, and after returning home utterly refused nourishment either by mouth or rectum. She protested that she was perfectly well,—that she had neither ache nor pain and that she never felt better in her life. She was very loquacious, very cheerful but withal very determined. She insisted on ice water baths and would drink large quantities of ice water. She was humored in all her fancies and lay with her hands and arms in cold water, with a cold water pack over the chest. My brother, Dr. C. F. Gilliam, visited her on the ninth day and found her in this condition. The surface of the body was cold, the pulse a mere thread and there seemed to be every indication of an early dissolution, but still she conversed, and was in a most happy state of mind. To his suggestion that the cold water be dispensed with and that nourishment be exhibited, she remarked that the doctors were all right for the cutting but that she was managing this part of the affair, and intimated that she would tolerate no intervention.

He reported to me and on the next day I visited her. The cold

pack had been removed, the hands and arms taken out of the water and she was greatly changed for the better. The surface was warm, the pulse quite strong and running about 100 to the minute, the voice strong and I thought she would recover. After this I did not see her but she died on the thirteenth day evidently from inanition. There never at any time existed evidence of septicemia and there was no abdominal distention. The anastomosis must have been perfect as from the large quantity of water ingested there otherwise would have been trouble with the peritoneum. Had I recognized the mental condition, or suspected the absence of proper care and attention at home I should not have consented to her removal.

A STUDY OF INTESTINAL PERFORATION AND PERITONITIS IN TYPHOID FEVER, WITH A REPORT OF 3 SUCCESSFUL OPERATIONS, AND A STATISTICAL INVESTIGATION OF 295 OPERATIVE CASES.

By WILLIAM D. HAGGARD, M.D.,
NASHVILLE.

THAT immortal phrase,—"The resources of surgery are rarely successful when practised on the dying," has been most wonderfully negated in the operative treatment of perforative peritonitis in typhoid fever. Surgery has reclaimed many otherwise irremediable conditions. It was a great step when Sims suggested abdominal section for intestinal perforation for gunshot wounds, which daily rescues many victims. It was a great step when Fitz and McBurney taught us the frequency and means of relief of perforation of the appendix, which has saved so many valuable lives. But it is a still greater achievement to be able to succor the hopeless sufferer from the onslaught of a fatal peritonitis from perforation in typhoid fever.

The possibilities of this latter achievement, however, have not yet been appreciated keenly enough by the profession. It is almost a score of years since Mikulicz did his first operation in 1884. Since that time, I am only able to collect, from all sources, by the most diligent search through the literature, together with cases personally communicated, 295 cases that have been subjected to operation up to May 1, 1903. Granting that there have been as many, or twice as many, more cases that have not been reported or found, I still claim that the total sum is pitiably meager.

When we reflect that an estimate of 500.000 cases a year occur in this country alone, and with a general death rate of 10 per cent. to 15 per cent., 50,000 or 75,000 souls perish annually from this terrible scourage which we daily implore families and municipalities to prevent, it becomes necessary for the profession to bestir itself to reduce the mortality statistics of this disease.

Osler says that one-third of the deaths from typhoid fever are due to intestinal perforation. Taylor thus estimates that 25,000 deaths occur yearly from this accident. On the basis of a possible 30 per cent. recovery by operative interference, he further concludes that 7,500 persons perish in the United States each year who might be saved.

The reasons for this are complex. They are partly preventable and partly irremediable at this time. One explanation is the reluctance with which the practitioner invokes the aid of surgery in the presence of such forbidding general symptoms. Another is the likelihood of death even with operation; but greatest of all is the great difficulty of making a positive diagnosis in the early stages. This difficulty will always exist, with our present methods of diagnosis. It may be considerably lessened by possessing a proper appreciation of even the suspicious abdominal symptoms,—intelligent alertness, and frequent examination.

Perhaps the greatest stumbling block is the classical picture of perforation which needs erasing: the drawn, pinched features, pointed nose, profuse sweat, cold extremities, rapid, feeble pulse, short, sighing respiration, distended and motionless abdomen, restlessness and delirium,—these are the late and lethal manifestations of peritonitis and not of perforation.

I regret that the other side of the shield does not bear as characteristic a picture of the early symptoms of perforation. Some cases are fairly typical, but others presenting such presumably typical symptoms are found not to have perforation. Again, peritonitis may be the first symptom. Given, a man in the third week of a mild attack, without abdominal symptoms and pursuing a regular course, who is suddenly seized with an acute, paroxysmal pain in the right lower quadrant of the abdomen that causes him to cry out, that is unrelieved by ordinary measures, followed by collapse, sub-normal temperature and rapid pulse, which are succeeded by a rise in temperature in a few hours, associated with continued pain, considerable tenderness and right-sided rigidity together with a rapidly increasing leucocytosis, the diagnosis of intestinal perforation is reasonably certain,—not absolutely,—but surgically. All such cases should be operated on as quickly as possible. The difficulty is that all cases do not present this typical grouping.

No abdominal symptom objective or subjective occurring in typhoid should be considered trivial. Pain is usually the first note of alarm. My study of the reported cases develops that a sudden

severe, colicky pain is present in large majority of cases. Collapse is an infrequent attendant of perforation and was present in only about 6 or 7 per cent. Fall in temperature was not constant but rise in pulse was rather uniform.

Of the physical signs tenderness (sensitiveness) was found to be the most constant. And studied in the order of their development and more especially their significance, it was found that pain, then tenderness, then rigidity and then localization in one spot occurred. Persistence of symptoms serves to distinguish them from colic which should disappear in a few hours or change its location.

Recognizing the difficulties and limitations in diagnosis, exploratory incision should be regarded as a necessary and final aid in diagnosis. The facts about intestinal perforation which I have deduced from a statistical study of the cases may be summarized as follows:—

I. It occurs more often in men than women,—80.9 per cent. vs. 19.1 per cent. It is, like hemorrhage, rare in children.

II. It occurs in about 2.5 per cent. of all cases of typhoid fever.

III. 3.31 per cent occur in the 1st week; 20.19 per cent in 2nd week; 38.94 per cent. in 3rd week; 14.90 per cent. in 4th week; 9.13 per cent in 5th week; 5.75 per cent. in 6th week; 7.21 per cent. from 7th to 11th week, and it has been observed as late as 100th day (Curschmann). Holmes operated on 1 case after 4 months.

IV. It naturally occurs more frequently in severe attacks, but may occur in mild attacks, and it may be the first real symptom of so-called walking typhoid.

V. It occurs in the ileum in 95.5 per cent, usually within 18 in. of cecum (Osler) always within 3 ft. (Loison); in the large intestine in 12.9 per cent., and is most often situated in the ascending, transverse and descending colon, sigmoid and rectum, in the order named. It may occur, also, in the appendix, Mickel's diverticulum and the jejunum.

VI. The perforation is single in 84 per cent. There may be 2 or more, and in one case there were 25 (post-mortem). Cases with diarrhea and tympany are more likely to have perforation. Six out of 30 cases occurred with hemorrhage (Osler).

VII. The death rate given by Murchison is 90 per cent. to 95 per cent. Osler says he could not recall a single case in his experience that had recovered after perforation had occurred.

Occasionally the careful observer and conscientious surgeon,

in his earnest effort to interpret signs aright, and to operate before general peritonitis has rendered the patient hopeless, may open the abdomen to find no lesion whatever. This has been done by the most expert, and will sometimes happen until we devise some absolute early sign. Commonly the patients progress and get well, as though nothing had been done to them. It has demonstrated the fact that these patients will bear the surgery necessary to make a positive diagnosis in suspected, but doubtful cases. Indeed, Finney advises exploratory laparatomy under cocaine anesthesia in suspected cases. To be sure, there is some chagrin attaching to a seemingly unnecessary operation, but it is much better to do such an operation upon a mistaken diagnosis, than to neglect to do it upon a case that demands it.

To avoid this embarrassment Connell has ingeniously devised recently a procedure based upon the fact that sulphureted hydrogen will, when passed through a solution of acetate of lead, turn it black by the formation of sulphide of lead. He proposes, as the result of animal experimentation, to introduce an ordinary trocar and canula into the lower part of the abdomen in suspected cases of intestinal perforation, to insufflate filtered air, which, mixing with the intestinal gas in the peritoneal cavity is allowed to escape through another canula at the upper part of the abdomen, into a solution of acetate of lead. If sulphureted hydrogen be present as a result of a perforation, the reaction will take place.

Other experiments were made by injecting sterile salt solution, and withdrawing it in from 3 to 12 hours. Where the intestine had been intentionally punctured or opened, and the salt solution allowed to mix with the fecal extravasation, when it was withdrawn, ammonia could be detected by Nessler's reagent, indol by sodium nitrate and sulphuric acid, and proteoses by the biuret test.

None of these tests were positive in air or fluid injected and recovered from the normal peritoneal cavity. The method appears to be harmless, but lacks additional confirmation as to its uniformity and reliability. Meanwhile, the diagnosis of perforation must rest upon the minutest scrutiny of suspicious signs, which, if deemed reasonably certain, should demand an exploration; or, upon the advent of peritonitis, it should be imperative. The mild and early symptoms are the important ones. The severe symptoms usually mean peritonitis.

It is surgically immaterial whether a perforation exists or not

if there is peritonitis. It is more apt to be localized if there is no great extravasation. Peritonitis in typhoid fever may be due to migration of bacteria through the intestinal walls without actual perforation, as evidenced by the number of cases of peritonitis without perforation. It may result from ruptured abscess of the liver, rupture of the spleen, of the gall-bladder or ducts, of the mesenteric glands, appendix, and from gangrene of the intestine caused by thrombosis.

The surgeon should stand in close relationship with the physician in typhoid fever, as is now the quite general custom in appendicitis. Cushing advises that he should be consulted at the first indication of a localized peritonitis; should perforation and extravasation occur operation may then be undertaken without delay. Osler advises:—"In doubtful cases patients should be given the benefit of the doubt and operation urged" (London *Lancet*, February 9, 1901). Keen says "We should operate in practically every case of perforation, unless the condition is such that recovery is evidently hopeless" (*A. M. A. Jour.*, June 20, 1900, p. 131). Further "after perforation has occurred operation should be done at the earliest possible moment, provided that we wait till the primary shock, if any be present, has subsided."

CASE I.—My first case was in 1898, and reported in the Trans. of the Southern Surg. and Gyneco. Assn., 1899. Woman, 19 years of age, married 8 months. In the 3rd week of severe typhoid fever with delirium, a tender swelling developed in right iliac region, that was quite frank and prominent. When I incised it the gas and pus were forcibly ejected from the tension in the sac. It was larger than a cocoa-nut, and well walled-off.

The cavity healed in about 3 weeks. The fever progressed with increasing severity and she died from toxemia, 3½ weeks after operation in the 7th week of the disease. Widal's test positive. No autopsy. This case is very similar to case No. 122, in Keen's list, reported by Munro, which is recorded as a surgical recovery.

CASE II.—July, 1901. Boy, 9 years of age with mild typhoid, with some tenderness and slight rigidity in the right iliac region that inclined us to the diagnosis of appendicitis. On the 19th day he developed symptoms of localized peritonitis in right iliac region. Incision over the slightly dull tumor, at my clinic at the University of the South, revealed a fairly well walled-off area, the walls of which were almost in apposition; the sides and bottom of which presented 3 perforations; 2 appeared to be in

the inner wall, composed of small bowel, and 1 in the outer wall or colon; no pus but a slight amount of fecal fluid. All of these openings were sutured and drainage established. A fecal fistula appeared on the 3rd day and has persisted since. He remained in bed with typhoid symptoms and temperature for 10 weeks, and developed a left suppurating parotid. I closed the fistula 18 months afterward with success.

These cases were examples of the two types of local peritonitis, —perforation with abscess formation, and perforation with walling-off by adhesive peritonitis, the perforation still patent.

CASE III. *Example of Free Perforation.*—Male, æt. 34; in previous good health. He was under the care of Dr. Sugg, of Beachville, Tenn. On October 8th, 1903 (the 12th day of the disease), the temp. was 101, instead of 100 as usual; the pulse 92 instead of 72 or 80. An enema was given, which acted well. At 11 o'clock the patient was seized with sudden, severe, colicky, abdominal pain. The pain abated somewhat, and when the doctor reached him the temperature was normal and pulse 72. An enema was ordered and a turpentine stupe applied. At this time there was little or no tympanitis, nor had there been in the entire progress of the case.

At 2 p.m.—3 hours after the onset of pain, the patient was still suffering with considerable abdominal pain. There was slight tenderness on pressure over the abdomen, which was most pronounced in the right lower quadrant, extending a trifle to the left of the median line. There was slight abdominal distention. The temperature had risen to 104 and pulse was 120. The face was anxious and apprehensive.

Dr. Sugg made the diagnosis of perforation. The patient was 10 miles in the country, and I reached him 7½ hours after the onset of pain. The conditions were unchanged, except the temperature had receded to 102.6 and the pulse was 116. The sudden onset of acute abdominal pain in the second week of a mild case of typhoid, followed by rapid rise in temperature and pulse-rate, the anxious facies, the undiminished pain, the distention, tenderness and rigidity indicative of beginning peritonitis, pointed quite strongly to perforation.

Although it was after nightfall, in a 3-room farm house, with no facilities for operating, yet in the face of an otherwise fatal issue, and with the patient's consent, preparations were made as rapidly and completely as possible, and abdominal section was made 8½ hours after the onset of pain. When the peritoneum

was opened in the right semilunaris, a quantity of free, odorless, chyme-like, yellow fluid made its escape. The cecum was at once located and pulled up with the appendix for inspection. The latter was found to be normal. The adjacent ileum was deeply injected and presented a modena-color, and was slimy from being bathed in the pea-soup effusion. It was passed between the fingers for a few inches and at about 12 inches from the cecal extremity, the perforation was found. The actual opening was small and situated in the center of an indurated area about as large as a 5-cent piece. Upon manipulation there exuded from the perforation yellowish intestinal contents corresponding in color and odorlessness to the free fluid found in the cavity. The knuckle of gut, containing the perforation was surrounded by gauze pads and the indurated area containing it was inverted by 5 Lembert sutures of small silk. A second layer was placed above and between the first row and at the angles.

The sutured area was temporarily surrounded with gauze and replaced in the cavity pending the peritoneal toilet. As much of the pea-soup material as possible was sponged out of the right iliac fossa and the pelvis, and then the cavity was filled with salt solution poured from a pitcher. The small quantity that was prepared in the limited time was exhausted before the cavity was at all clean, and here came the greatest technical difficulty of the operation. There was an abundance of boiling water, but no cool boiled water. A by-stander was sent to the spring with a clean pitcher for water which had to be dipped up. This delayed us some minutes. I thought the unsterilized water was less harmful than the known septic fluid.

The irrigation was satisfactorily completed and the patient turned on his side and all fluid allowed to run out. The gauze around the injured intestine was replaced by two clean gauze strips which met under the perforation which was so disposed as to bring that portion just under the incision. A gauze strip was introduced into the bottom of the pelvis, and another in the right flank and the wound closed by interrupted wormgut sutures. The entire operation comprised 38 minutes, including the delay.

The pulse at completion was 96, and not above 84 on the following day. The temperature did not exceed 100.8. On the second night the temperature reached 102 and the pulse, after the excitement of being told of his serious condition by his wife, went to 120. With that exception the pulse did not go above 108. The facies during the second night was anxious, the legs

flexed, the respiration difficult, nausea was persistent and vomiting frequent and offensive. There was considerable distention and severe pain, requiring ⅛ gr. morphia, with marked subsidence of the symptoms. Flatus was passed in considerable quantity toward morning and the patient was more comfortable, but the mind was not clear.

The gauze was removed in 40 hours being loosened by hot salt solution introduced by a glass catheter, which was allowed to run into the abdomen until it came back clear. The bowels moved well after this, and the case progressed satisfactorily with a morning remission to 100 and an evening exacerbation to 101, pulse varying from 84 to 96.

On the 22d day of the fever and the 10th day after operation the temperature remained normal for two days and the stools appeared normal. On the 24th day he had a relapse, the temperature reaching 102.6 and the pulse 108. The tympany returned, rose-spots again appeared on the chest and abdomen, and the stools became loose and offensive. Defervescence occurred in the 5th week, the temperature returning to normal, and the belly became scaphoid. The patient became brighter and hungry. He was again considered convalescent, but after 3 days of convalescence he became somnolent and listless; the urine diminished in quantity and was found to contain albumin in considerable quantity. He was greatly weakened, but was able to leave his bed in the 8th week and has remained well since.

Technique.—Inasmuch as the usual site is near the ileo-cecal valve the right iliac incision should be chosen. In cases of general peritonitis a central incision is better.

The ulcer when found, may be trimmed or excised, or simple inversion by suture seems to be competent. The mattress suture has the advantage of only 1 knot for 2 threads. The second row may be continuous to save time and a third may be added if it does not constrict the lumen too much. Sutures may be transverse or longitudinal. Care should be taken not to cut off too much of the circulation when situated near the mesentery.

The Cargile membrane is recommended for additional protection. Search should be made for other perforations and any thinned areas inverted by suture. Resection may be practised if there is much destruction, but the formation of an artificial anus is best in the majority of cases in greatly debilitated subjects. Escher saved 3 out of 4 cases by ileostomy. Copious irrigation

is essential in extravasation or general peritonitis. Sponging out is better in localized and walled-off areas.

Drainage by the vagina is preferable in women. Lumbar puncture and drainage by tube and gauze are expedient in men. Most of the wound may be left open with advantage and the damaged area coffer-dammed with gauze and located very near the incision.

To facilitate drainage and localize infection in the less vulnerable pelvic peritoneum, instead of the fatally absorptive diaphragmatic area, Fowler advocates sitting the patient up at an angle of 40 degrees. Murphy reported 6 cases—consecutive—of general peritonitis (1 typhoid) which recovered where this was done. I have for some years been turning the drained cases of appendicitis on the right side from the start with this idea in view.

Statistics.—Westcott collected 83 cases in 1897 (pub. by Keen) 16 recoveries, 19.36 per cent; Tinker collected 75 cases in 1898 (pub. by Keen) 21 recoveries, 26.66 per cent. I have collected 137 cases (published and unpublished) 43 recoveries, 31.31 per cent. This makes a total of 295 cases, of which 80 recoveries, 27.11 per cent. Of this grand total only 246 were sufficiently complete for purposes of study. Of this number there were: 89 cases of free perforation, 29 recoveries, 36 per cent; 19 cases of localized peritonitis, 9 recoveries, 47.3 per cent.; 138 cases of general peritonitis, 29 recoveries, 21 per cent. There were 16 cases done at Johns Hopkins up to 1901 with 6 deaths, 37.5 per cent. Cushing did 11 cases with 5 recoveries, or 45.5 per cent. He predicts that the per cent. of recovery will soon be from 50 per cent. to 60 per cent.

I feel that a saving of over 27 per cent. in all cases, good and bad, extending over a period of 20 years is a most encouraging showing and that 36 per cent. in cases of free perforation should encourage us to a more prompt diagnosis and the invocation of surgical relief to these otherwise hopeless subjects. A more general appreciation and application of the possibilities of operation for typhoid perforation will not only be a great surgical triumph, but will add many precious years to the span of human life.

DISCUSSION.

DR. JOHN B. MURPHY, Chicago.—I wish to congratulate the essayist, first, on his collection of cases; second, on the care of his analysis; and third, on the emphasis which he places upon the importance of early operative intervention when symptoms of peritonitis are present, not when perforation takes place. I have had the experience of operating on two cases of suppurative peritonitis in typhoid without perforation. Both of them recovered. It is legitimate, from a pathological standpoint, to have peritonitis from a typhoid ulcer infection just penetrating, not perforating, by infecting through the wall of the intestine where the mucosa is destroyed by the ulcer. When the epithelial lining or covering of the mucosa is diseased, we have sepsis present. There is a direct means of transmission of infection through the wall of the intestine, where it has been deprived of its protectors. In the two cases referred to we could see the position at which the infection occurred. There was an increased deposit of exudate in the neighborhood, but no perforation in either of the cases, although infection occurred from the ulceration.

The symptoms which Dr. Haggard laid so much stress upon—namely, sudden onset of pain, local hyper-sensitiveness to pressure, nausea or vomiting, which is the reflex nausea and vomiting of peritonitis, are important. I speak of primary nausea and vomiting, and it is a fortunate thing that we have with every type of perforative peritonitis, or of inflammation of the peritoneum, primary nausea and vomiting, which are mild, lasting only a few minutes and then passing off, and if the patient is not operated upon he will have later severe nausea and vomiting which are manifestations of absorption of the products of infection and are persistent unto death.

I congratulate the essayist on the emphasis which he placed upon the absence of manifestations of collapse. It has been ground into the profession so long and persistently and so forcibly that collapse is a manifestation of perforation, it is now difficult to get the general practitioner and the surgeon to give up that idea. Collapse is a manifestation of absorption of the products of infection, and not of perforation itself. Collapse is a late symptom. In this connection, the word late may mean a few hours, twenty-four hours, forty-eight hours or seventy-two hours, depending upon the virulence of the type of infection which takes place after perforation.

Leucocytosis deserves consideration at this particular time. You know that whenever we discover a new indication of disease we attach too much importance to it, as a rule, and leucocytosis is no exception. We had last year in the Cook county hospital a number of cases of perforation from typhoid fever, with no increase whatever in the number of leucocytes.

Leucocytosis is a manifestation of the reaction of the blood to septic stimulation. In typhoid our patients are not infrequently in such a condition that the blood does not react to the infection in the way of offering resistance. I suggest that as an explanation, although I do not know that it is the proper one; but it is clinically true that in a large number of cases of typhoid perforation there is no leucocytosis, and therefore too much importance should not be attached to this evidence. One of my cases was the most pronounced exhibition of peritonitis that I ever had of the typhoid variety, in which there was no perforation. The man had a pulse of 140, with temperature of 105½°. His abdomen was ballooned and still there was no perforation that could be detected, but the ulcer from which the infection came was outlined by plastic exudate.

An important point in connection with the treatment of these cases which I feel it is necessary to mention, is not to do too much surgery. We should endeavor to open the abdomen quickly, close the perforation and get out quickly. Do not tamper with the intestines, to a greater or less degree. If you elevate the body the fluid tends to settle in the most dependent position,—namely, the pelvis. If the patient is in the Fowler position the fluid will drain without being washed out. If there is severe tympany we have the greatest danger. What does tympany mean? It does not mean merely that we have a paralyzed bowel with absorption of its decomposed contents, but infective material retained in the peritoneal cavity which may not settle in one place. It is infection products, retained under *pressure*, and *pressure* is the important element..

If a man has an abscess of the tibia or osteomyelitis, what do we do? We puncture the abscess without irrigating or swabbing it, without doing anything except to relieve the pressure. What happens? Symptoms of absorption subside; relieve pressure from any focus of acute infection in the body, the temperature drops. Absorption ceases as soon as the pressure is removed, but not in the stretococcus type of infection, because in that type the lympathtics are infected; the infection has passed beyond the point of liberation by puncture. It is necessary to do everything possible to relieve intestinal tension or tympany. In a meeting of gynecologists it is very important to impress early operative intervention on the slightest manifestation of peritonitis and we congratulate ourselves when we have opened the abdomen in a case of peritonitis and find there is no infection, instead of being humiliated. All cases of peritonitis should have rectal transfusions of from one to three pints of normal salt solution every two hours. It should seep in so slowly that no spasm of the rectum is produced, *i.e.*, it should take at least twenty minutes for each pint to flow in. The tube should remain constantly in the rectum. As much as 16 pints will be absorbed in 24 hours..

This large quantity of water has three effects. First, it keeps up arterial tension; second, it dilutes the poison, and third, it

favors elimination of the poison through the skin and kidneys and thus aids in tiding the patient over the fatal dose of sepsis.

Dr. Robert T. Morris, New York.—In view of Dr. Haggard's presentation of the subject, it seems to me that the general practitioner must still further feel impelled to call a surgeon to his aid in almost any case of typhoid fever, not necessarily for operation, but for consultation. It is a wise precaution for his patient. As Dr. Haggard has said, we should be prepared for complications that go with perforation, but in a larger view of the subject, to include the point made by Dr. Murphy, simple peritonitis from extension of infection should be relieved by opening the abdomen and draining.

An important point that has not been discussed is hemorrhage. Hemorrhage is dangerous in typhoid cases, but it has not yet received the attention that should have been give to it by Dr. Murphy, Dr. Mayo, and all of us who are engaged in this work. Hemorrhage as a complication of typhoid will be treated surgically within the next decade. Perforation, peritonitis without perforation, and hemorrhage are the three factors causing death in such a proportion of the cases, and are so well managed by surgeons, that the physician should call a surgeon or be prepared to subsidize him in almost any case of typhoid fever. I gave this advice to one of our local practitioners. A boy was ill with typhoid fever; his father came to New York and asked me if I had confidence in the physician. I told him that I believed he would do everything for the boy, but that it was very essential to have a surgeon near at hand.

I was very glad to have the point brought out by Dr. Haggard that we must put aside the picture of perforation, as it is depicted in the textbooks. In the beginning of a typhoid epidemic, at Ithaca, I was called to see a patient in collapse. I was told that he had been walking about and that for two days he had had abdominal pains which were more intense than any pain he experienced before. He kept on at his work. He laid down while the pain was severe, got up and went to work again. Forty-eight hours later his abdomen was tense, with firm rigidity of the abdominal muscles. I opened the abdomen and found that he had a typhoid perforation. We suspected that this perforation had occurred forty-eight hours previously, or at least we dated it from the time he had intense pain and this was the first symptom of typhoid recognized. The diagnosis had not been previously made.

In another case of typhoid perforation the patient recovered. He had a perforation of the ileum about four inches from the colon. He recovered from the perforation without operation. He became a convalescent and walked out. I saw the case in consultation. Suddenly he developed intestinal obstruction and died while convalescing. We found that he had a typhoid perforation and that bowel contents had escaped and had become

walled in. He died from angulation of the bowel at the site of the typhoid perforation.

In flushing out the abdomen of these patients it seems to me we must use salt solution, but in the first place, we should give the patient an intravenous injection of salt solution. I believe that is very important. These patients are in a bad condition. We can open a vein in the arm and give them 1000 or 1500 cubic centimeters of salt solution. Usually they bear the operation well if this is given as a preliminary measure. In flushing out the abdomen, use salt solution, not plain, sterilized water, as Dr. Mayo said yesterday. If you open your eye, drop in a plain drop of water with pipette, it will smart. You rub it and it is red for half an hour afterwards, but if you drop in a drop of salt solution, you do not know it is there unless the doctor tells you. That is the difference. The reason is because plain water takes salts from the cells and in extracting them by osmosis, becomes corrosive in its action and irritating. Salt solution is not corrosive and does not produce irritation. Keep the illustration in mind when you put in the patient's abdomen a gallon or two gallons of hot water. You have several cubic square feet of eye exposed to the corroding water. This is often a cause of collapse. If you take several feet of eye and use salt solution, you avoid that feature, which is one of great importance.

DR. WILLIS G. MACDONALD, Albany.—I think what I may say in addition to what has already been offered will add very little to the value of this discussion. I regret very much not to have heard all of Dr. Haggard's paper. So much as I did hear, however, commends itself strongly to me. He has presented the best that has been given in this very important department of surgery. It is a subject which must be discussed in societies like this, and rediscussed in our state, county, and village societies, in order that several of the questions which have been so well presented by Dr. Murphy and others may be better understood by all physicians.

I was very much impressed a year or two since by a description given by Dr. Osler, of factors connected with perforation of the intestine as associated with typhoid fever. He brought forward again the very statements made by the gentlemen here—namely, that the factors of perforation nowadays are seldom, if ever, associated with a distinctive shock, and that the classical description presented of perforation in typhoid fever was not a description of perforation at all, but was rather a fine description of impending death.

In relation to the technique associated with operative intervention in typhoid fever, it seems to me sometimes that the surgeon is fortunate in not having a great supply of sterile water at hand. It relieves him of the temptation of doing too much surgery in these serious cases, when to get into the abdomen quickly and get out as quickly, is associated with the most definite success in the way of saving life. Within the last two years, in the severer at-

tacks of peritonitis, where the patient has already showed distinctive evidences of serious shock to the system, and where we have the indications which you all fear in the pulse, which tells you that twenty minutes after anesthesia you are going to have a patient in a serious condition, instead of employing normal salt solution as a preventive, as suggested by Dr. Morris, I have rather withheld general anesthesia and used a mixture of morphine, cocaine, and adrenalin, and I have been able in nearly every case to open the abdomen comfortably, and I have found also that so long as I did not pull too much on the intestine, I had very little difficulty in operating.

In a number of instances I have been able to do laparotomies for cholecystitis, pack off the gall-bladder, pull it into the wound and fix it, without giving the patient much pain under purely local anesthesia. On one occasion I was impelled to close five perforations of the intestine from a revolver, without general anesthesia and in which I left the abdomen open. In some of these cases, you can get a good way on in your operation for typhoid perforation by local anesthesia, and save the patient the shock of a general anesthetic, which I regard as of great importance in this surgical work. I think this important factor is appreciated by everyone who is operating, particularly under the conditions described by Dr. Haggard, where the anesthetist is not always an expert, where he has a lack of confidence in himself, fears the patient is desperately ill while the operation is going on and, if death ensues, it is going to be attributed to the use of the anesthetic. When such a man is in this frame of mind, it is difficult for him to lend that assistance which the operator should receive.

DR. C. H. MAYO, Rochester, Minn. (by invitation.)—I have been very much interested in this most important paper. Dr. Haggard has given us a résumé which almost completely covers all the work done since the first case of this kind was reported. He has classified his material so that it will be useful as a matter of history. Besides that, with his three successful cases, he has done one of the most important things in the advancement of any new topic—namely, to report what is best to do and then clinch the argument with a report of successful cases.

Situated as I am geographically, I see very little typhoid, and the last case of perforation of the intestine in typhoid fever which I saw, was fifteen years ago. This may seem a peculiar statement for me to make, and in saying so I must also add that we do not have much typhoid fever in the section of the country where I reside. Typhoid fever follows the segregation of people who are accumulating their own filth. Years ago, in our section, we had a great deal of typhoid fever. When people first arrived in the West, they had no time to dig deep wells. They drank surface water. They accumulated filth and consequently typhoid resulted. As they improved in prosperity in these communities, the wells were dug deeper, and better care of water

supply has been taken in our small cities. The working people own their own houses, they have a better water supply, and the people generally do not accumulate filth to the extent they formerly did. The result is that in our city, we have no cases of typhoid except those imported. The people, perhaps, have been visiting in the larger cities and are not accustomed to the water. For instance, in Chicago, the people become accustomed to their drinking water, and they are not so prone to contract typhoid fever from drinking water as strangers would be while making visits there.

With reference to the remarks made by Dr. Morris as to the use of salt solution, I wish to say that it is rarely we use irrigation for any purpose unless it is positively indicated. When we do, we much prefer the use of plain water to quantities of salt, which is often used without being sterilized, and frequently contains dust and dirt. Of course, we use salines in our work.

DR. HAGGARD (closing the discussion).—As the hour has arrived for the delivery of the Presidential Address, I shall not consume the time of the association other than to express my appreciation of the generous discussion that has been accorded my paper, and request of the members additional reports of cases, in order that they may be added to the list and thus enable me to bring it up to date, for a future report.

THE RATIONAL TREATMENT OF POSTPARTUM INFECTIONS OF THE UTERUS.

By D. TOD GILLIAM, M.D.,
COLUMBUS.

Some years ago the master obstetrician placed in the hands of the general practitioner the douche and curet, with instructions to use them freely in all cases of anticipated or suspected infection of the uterine cavity. Of late he has been making strenuous efforts to reclaim them, having recognized his mistake; but the general practitioner having learned their use is loth to part with them, feeling that in so doing he is showing a craven spirit by disarming in the presence of the enemy. He argues thus: "The uterine cavity is the rendezvous of pathogenic germs and the source from which systemic infection is derived, hence it is clearly my duty to clean out the uterine cavity." It is for counteracting such specious sophistry and giving the reasons therefor that this paper is written. I am aware that it is in many respects too elementary for you, but it is submitted through you to those who need it with such emendations as you may choose to offer for the benefit of the childbearing woman. The rational treatment of postpartum infection of the uterus presupposes a knowledge of the infecting agencies, their nature and tendencies and of the conditions which favor or retard their entrance into the general system.

The Bacteria of Puerperal Infection.—The bacteria of puerperal infection are essentially the same as those that take part in other pathologic processes of the genital tract. Chief among these are the streptococcus, gonococcus, colon bacillus and the saprophyte. The saprophyte is a carrion maker, and subsists entirely on dead tissue. It never attacks the living cell, almost never invades the deeper structures of the healthy organism, nor quits its place until its pabulum is exhausted, when it dies of starvation. It is, however, capable of exerting a baneful influence on the economy through its absorbed secretions—the toxins. When

the blood is charged with these products, it constitutes that form of puerperal infection known as sapremia. Saprophytic or putrid infection occurs when fetal debris (fragments of placenta or membranes) have been left in the uterine cavity, or when, as the result of trauma or other cause, the uterine mucosa has become necrotic. It follows, then, that the saprophyte is pernicious only through its products, and that it will cease to do harm so soon as its pabulum—the fetal debris—is exhausted or expelled from the uterine cavity. Both the gonococcus and colon bacillus are surface germs, showing little tendency to penetrate into the depth of tissues or disseminate broadcast through the general system. The streptococcus is the most deadly of germs connected with puerperal infection. In contradistinction to the other germs it may and does proliferate in living tissues. It is aggressive and migratory and seeks the lymph and blood streams for transportation to remote parts. While all of these germs are capable of producing invalidism, there is only one—the streptococcus—that jeopardises life. This assertion is to be taken in a general sense, as other bacteria have on occasion been the causative factors of serious, or even fatal infection.

Differentiation.—It becomes then a matter of much importance to distinguish between streptococcus infection and that of other germs. This can only be done positively by microscopic examination of the lochia. Unfortunately, even this is at times misleading or utterly unavailing. Furthermore, it is not always practicable, especially in the less densely populated districts, hence it becomes necessary to depend on the clinical evidences. It may be stated, as a rule, that putrid infection—and this constitutes the bulk of the cases met with—is characterized by high temperature, slow pulse and foul odor; whereas, in streptococcus infection there is no odor in the earlier stages, and the pulse is markedly accelerated, according to the virulence of the infection. At a later stage, there may be foul odor from necrosis of the endometrium. Suppression of the lochia is a fairly constant and early symptom in streptococcus infection. Digital examination of the uterine cavity will also give valuable evidence. In putrid infection the uterine cavity contains debris, whereas in streptococcus infection the mucosa may be perfectly smooth. Putrid infection, or any other form of germ infection may be complicated with streptococcus infection.

Prognosis.—The character of the germ being determined, the prognosis will follow. "If," says Whitridge Williams, "I find

the streptococcus present and the condition serious, I am very much alarmed about it. If the gonococcus is present, I do not bother much about it. If the colon bacillus is present I bother very little about it, and if the ordinary putrefactive organisms are present, I do not bother at all about the case."

Taking the cases in general, statistics gathered on rather a large scale give a normal death rate for puerperal infection of about one in a hundred. In epidemics, which are usually the result of streptococcus infection, this rate is materially and sometimes greatly increased. In streptococcus infection alone, the death rate is about one in twenty or twenty-five; the average of streptococcus cases as compared with others is about one in five, (Pryor) so it will be seen that the chances for life of the puerperally infected woman, if left alone, are about ninety-nine out of a hundred.

Conditions Favoring Infection.—The increased vulnerability of the puerperal uterus is due to the enormous increase of its bloodvessels and lymphatics which afford unparalleled facilities for the distribution of germs. When the pregnant uterus has expelled its contents, it becomes an effete organ and begins to disintegrate. The detritus fills the interstices of its walls, freights the lymphatics, and oozes into the uterine cavity. This together with the clotted plugs of the exposed vessels and sinuses and the residual blood of the cavity afford an excellent culture medium for germs. These germs gain access to the deeper structures through the vessels and lymphatics at the placental site, or other lesion in the uterine mucosa.

Safeguards Against Infection.—With the conditions portrayed above, the wonder is, not that puerperal infection is so frequent, but rather that it is not an unfailing sequence to every childbirth. Happily for womankind and the human race there are counteracting influences which, if properly fostered, will safeguard the mother and render infection even less frequent than at present. The safeguards of which we shall take account are:

1. Auto-sterilization of the genital tract.
2. The epithelial-clad surface of the uterine mucosa.
3. The massing of germicidal leycocytes beneath the epithelium.

With the advent of pregnancy sterilization begins and continues until the genital tract is germ-free and proof against infection, unless germs are introduced from without. The second safeguard is the epithelial-clad surface of the uterine cavity which covers and protects the lymph spaces and under ordinary con-

ditions offers an effectual barrier to germ invasion. There must also be some condition to oppose germ invasion at the placental site, as in the absence of lesion of other portions of the mucosa systemic infection is comparatively infrequent and less severe. It is not improbable that the open-mouthed vessels are protected by the outflowing tide of blood charged with phagocytes. Possibly the placental site may be clothed with a layer of embryonic epithelium. I infer such to be the case from the known fact that the casting of decidual growths in general is preceded by a new formation beneath it. Instance the shedding of the scarf skin in animals and serpents. If this be so, it goes far toward explaining the situation.

The third safeguard against infection is found in the massing of leucocytes immediately beneath the epithelium and in front of the lymph spaces, which are there to give battle to any germs which may have passed the protective epithelium or have gained access through a breach in the same.

Auto-sterilization of the Genital Tract.—One of the principal agents in effecting the expurgation of the genital tract is the germ of Doederlein which through its acid secretion destroys all harmful organisms, with the possible exception of the gonococcus and the gas-secreting bacillus. The habitat of the germ is in the vagina, especially in its lower portion, where it keeps watch and ward over the introitus. The impropriety of washing out the vagina as a preliminary to labor is made evident when we consider that in so doing we wash away the germ which guards against infection. Exception may be made where there is obvious gonorrheal infection. It follows, then, that the best prophylaxis is absolute noninterference. During labor there should be no more intravaginal manipulation than is absolutely necessary, and this in most cases is almost none. The habit of rummaging in the vagina of the parturient woman as indulged in by the old-time obstetrician is unnecessary and pernicious. It goes without saying, that all manipulations should be conducted under the strictest aseptic regime.

The Protective Epithelium and Leucocytes.—At the expense of repeating myself, I wish to emphasize the fact that germs do not readily pass through the intact epithelium. The colon bacillus never quits the intestinal canal except through the floor of an ulcer. The vaginal epithelium is germ-proof, unless there be an abrasion of the surface or other pathologic change. The gonococcus is never found occupying the living cell or intercellular

substance of the tubal epithelium. Hence it is highly probable that the streptococcus will not traverse the intact epithelium of the uterine mucosa. But granting that it may, it cannot pass it in droves, and may then usually be met and beaten in detail by the protective leucocytes which are massed behind the epithelium.

The toxins may and do pass the epithelium, but so long as the germs themselves are confined within the uterine cavity the toxins almost never, if ever, acquire such concentration in the circulating fluids as to become lethal. If, however, the germs themselves enter the vascular channels and are distributed broadcast throughout the system, the opportunities for surcharging the fluids and tissues with their noxious products are multiplied in proportion to their number and virulence. It must be remembered, however, that the living tissues are germicidal, and, if not overwhelmed, will take care of themselves even in the presence of germs. The presence of streptococci in the blood, therefore, does not necessarily signalize a fatal infection. I would call attention to another fact pertinent to our inquiry, and that is, that germ invasion through an open surface usually takes place within the first few days after the lesion occurs. It is well known that fresh wounds are those from which blood poisoning ensues. After surgical operations, if the patient passes the fourth day without septic manifestations, the surgeon feels quite easy. A granulating sore is proof against infection, if undisturbed. Granulation is usually established by the fifth day. It is more than probable that a similar conservative change takes place in the uterine cavity. Hence it is quite fair to assume that bacterial invasion will not proceed from the uterine cavity after the first few days succeeding confinement. Any systemic disturbance after that period, provided there be no fresh lesion, is caused by the germs already in the blood or by the toxins. If this view be correct, cleansing the uterine cavity many days after confinement can be of little or no avail as a life-saving measure. This does not apply to the minor degrees of intoxication from the toxins, however, for the absorption of toxins goes on uninterruptedly so long as germs inhabit the uterine cavity. But the toxins do not kill, and any measures adopted to get rid of them must be devoid of danger to justify their use. A newly formed lesion of the mucosa produced by the indelicate use of an instrument may open the way for a fresh invasion of deadly germs with a fatal result. That such a result is often brought about by the injudicious use of the douche and curet, admits of no doubt. As has been seen the

normal death rate from puerperal infection is about 1 per cent. It has been found that after curettage this death rate is greatly increased, averaging in a series of cases more than 20 per cent. This is appalling, but it opens our eyes to the inexcusable folly of indiscriminate curettage. To the puerperal woman the man with a curet is more to be feared than shot and shell on the most sanguinary field of battle. I have no hesitation in saying that considering the temper and equipment of the average practitioner, the puerperal woman would fare much better without any local interference whatever.

Impracticability of Disinfecting the Uterus.—If it were practicable to clear the uterine cavity of germs by curettage or flushing, there would be no question of their utility, but such is not the case. Even under the most expert manipulation of the curet the germs will drop off or be washed off and adhere to the raw surface of the uterus. With organisms so small that a host of them may park on the point of a needle, it will be readily seen how impossible it is to effect complete dislodgement by agencies so gross and clumsy as currettage and flushing. But the chief difficulty lies in the bacteria which lie ensconced in the depressions of the uterine mucosa—the utricular glands and the crypts of the cervix. Here they are absolutely inaccessible and beyond the reach of any known agency. The curet, therefore, is clearly inadequate as a means of ridding the uterine cavity of germs. The sharp curet is especially dangerous as it not only fails to remove the germs, but destroys the protective barriers—the epithelium and leucocytes, and leaves an open way into the mouths of the lymphatics. No more effectual way for furthering systemic infection could be devised than by sharp curettage of the uterine cavity in the presence of the streptococcus. As it is impossible to say that the streptococcus is not present before evidences of infection are manifest, or that it is not associated with other germs after the same, the only safe way is to eschew the sharp curet entirely in postpartum cases.

When Curettage is Permissible.—There yet remains the question of invalidism. Putrid infection entails a greater or less degree of invalidism, and as it ceases immediately on the removal of the fetal debris, it were better to do so, provided it can be done with comparative safety. With every precaution against carrying infection, the uterine cavity should be explored by the finger and, if practicable, emptied by it. If curettage is required, the dull curet should be selected that the decidua may be removed

without breach of the epithelial-clad surface. More accurate and delicate work can be done with the stiff-handled instrument, as the operator has better control of it. A large curet should be used for advanced pregnancy. A sharp instrument will shave and either cut through placental tissue, thus leaving a residue, or going deeper denude the uterine wall, leaving a raw, bleeding surface.

Flushing.—The objection to flushing lies not so much in the act as in the manner in which it is done. Some years ago the New York Academy of Medicine, after prolonged consideration, promulgated the doctrine that in cases of puerperal infection the uterus should receive one good flushing after which there should be no repetition. For the skilful and careful manipulator, I think the rule is too stringent, for the careless and untutored it is too lax; since, one flushing, if improperly executed, may prove the undoing of the patient. It is an easy matter to carry germs into the uterine cavity on a douche tube in the hands of a careless operator, and just as easy to inflict injury upon the uterine wall by a clumsy one. While inveighing against the use of the douche as a routine practice, I am not averse to its use in competent hands at any stage of postpartum infection of the uterus.

How Flushing Should be Conducted.—I quote from Wetherell: "The patient should be gently lifted out of bed on a table in good light. The vulva and vagina are gently, but thoroughly, cleansed with soap, water, alcohol and a 2-per-cent. carbolic solution (I prefer a solution of 5 per cent. creoline in liquid green soap for the vagina). The vagina is mopped and dried and a retractor introduced. The cervix is grasped with a volsellum forceps and gently drawn down and steadied. The cervical canal is wiped out with gauze and any bits of membrane or fetal residue picked out with forceps. The uterine cavity may be gently irrigated with salt solution, or even wiped out with pure carbolic acid, if the surface be covered with diphtheritic or streptococcic membrane, and then gently dried with a strip of gauze." I would add that the douche tube—preferably a large size, soft rubber catheter—should be introduced under the eye and with the greatest gentleness. The irrigating fluid may be of plain water, the normal salt solution, or any of the nontoxic, antiseptic solutions. Of the latter the salt solution, collargolum or other allotropic silver solution and hydrogen dioxide are prime favorites. The douche may be repeated daily, or at shorter intervals, according to the effect on the patient. If the pulse and temperature

drop, the douche is doing good, and should be repeated on the first indication of recurrence, or the recrudescence may be anticipated after a little experience with the case. If no abatement of symptoms follows, the flushing were better discontinued.

Instillation of Alcohol into the Uterine Cavity.—In the year 1897 Dr. Edward J. Ill, of Newark, N. J., called the attention of this Association to the intrauterine instillation of alcohol in puerperal infection. His modification of Carossa's method is as follows: "Introduce a small size, soft rubber stomach-tube, with funnel attachment of length used for lavage of the stomach. Near funnel end there should be a clamp screw. The uterus and vagina are loosely, but completely, filled with iodoform gauze. Now, pour into the funnel about ℥ii of 25-per-cent. solution of 95 per cent. alcohol in water, and by gradually opening the clamp allow the fluid to enter tube. When the last of the solution reaches the clamp, it should be closed. This keeps the tube full and prevents entrance of air at subsequent fillings. This should be repeated every two hours. The gauze is changed at intervals of from three to six days. The treatment lasts from four to twelve days. The tube and packing should be introduced under the eye and with the same care and precautions as in flushing." Again and again, I would repeat, and vehemently insist, that manual or instrumental interference with the uterine cavity of any kind, if not properly done, were far better left undone.

DISCUSSION.

Dr. H. W. Longyear, Detroit.—In considering an important question of this kind the discussion should be amplified; indeed, it can scarcely be too extended. I agree most heartily with the deductions of the essayist, especially with reference to manipulation of the uterus in cases of puerperal infection. We should endeavor by every means possible to make a bacteriologic diagnosis. I think in this lies the pith of the whole business. If we can, by a microscopic examination, get at the exact cause of the infection, half the battle is won. If we do not do that, we are treating these cases in a haphazard manner. We may have a streptococcus infection, or we may have several other germs associated with it, but the streptococcus will be the dangerous one, as pointed out. It is the germ we fear.

The essayist did not say anything about the diphtheria germ, but I have had experience with a number of cases in which the genuine Klebs-Loeffler bacillus has been the active germ, and

these patients have made prompt recoveries upon the administration of serum. These germs had doubtless been introduced either by the accoucheur or nurse. To get at the bottom of these cases, in order to prevent infection, we should impress more and more upon the minds of those who attend them the necessity of making as aseptic an operation at the time as possible. If every case were attended by a physician accustomed to doing abdominal surgery, we would not have so many cases of infection. Many of the cases are treated by general practitioners who are not careful, especially in regard to their finger nails and hands, consequently, patients are infected. I remember tracing one case of infection to a severe attack of tonsillitis in a nurse, she having had the disease just before she attended the case, in fact, was recovering from the disease when she went to the patient. Tonsillitis means streptococcus infection. If the use of rubber gloves could become universal with the accoucheur infection would be rare. As regards the instillation of alcohol for the cure of streptococcus infection, I have not tried it. I do know the positive effect of iodine upon the streptococcus. I used it when in general practice in infections of the throat, and know that it does kill the streptococcus.

I believe the essayist is right in regard to the employment of the uterine douche. It should be used with the utmost care, and by an experienced person. I believe we can use the iodine mixture (iodine and glycerine equal parts) with perfect freedom inside the uterus and vagina. If we get these cases of streptococcus infection early, while the buckskin-like membrane appears on the vagina and cervix, and before it has extended into the uterus, we can cut short every one of them by the iodine treatment. It should be applied two or three times a day. If we do this, I believe it will cut these cases short in their incipiency. If the infection extends into the uterus, it is a different problem, and the patient may succumb to it. That is really the quintessence of treatment. Treat the cases locally, just as though you had an open sore anywhere else, and you will cure them. I use plenty of alcohol internally, also quinine, and I am a great believer in the use of the serum. I know we do not get the same kind of results from the antistreptococcic serum as we do in the treatment of diphtheria with its serum, but I do believe we get a decided supporting effect on the blood, and if we use it constantly in large quantities, we will get good effects in that way—namely, by increasing the resisting property of the blood.

DR. JOHN E. ALLABEN, Rockport, Ill. (by invitation).—I would like to say a few words with reference to the use of the curet, and tincture of iodine, mentioned by Dr. Longyear. One great error which leads to the use of the curet is a misunderstanding of the actual condition of the uterine mucosa after confinement. One case in my own experience brought this matter forcibly to my mind. A physician attended a patient with infection, and on examination said the lining membrane of the uterus revealed a

roughened condition at one point and finding this condition he used the curet vigorously, exhibiting some of the material removed, which in fact was not retained placental tissue but normal tissue of the uterus. After confinement, if the finger is passed into the uterus, it will be found that the organ is not smooth at the placental site, but is rough. This is its natural condition, and if it is smooth at this point it indicates that there is some retained placenta or membrane which may be removed with the forceps or finger.

The use of tincture of iodine is especially of service in cases of puerperal infection. I have used it frequently. I use Churchill's tincture in its full strength, which I think is much better than carbolic acid, because the latter produces more or less cauterization of the surfaces, and does not penetrate deeply into the infected uterine tissue. It may be merely the alcohol that has an antiseptic effect. I do not know, but certainly the strong iodine tincture seems often to relieve the symptoms of infection.

There is one other point I would like to mention, that is the importance of attending to the bowels. Very often in these cases there is autoinfection—an absorption of toxins from the bowels,—and a good saline cathartic should be administered to clear out the intestinal tract.

DR. THOMAS B. NOBLE, Indianapolis.—I wish to say a word or two regarding the measures to be instituted in the cure of these cases other than those of a local nature. Of course, it should be determined as to whether we have a true septicemia to deal with, a streptococcic infection, or staphylococcic, or both, or whether we have a sapremia, which will be immediately relieved when we clean the uterus.

I desire to call attention to the effect of antistreptococcic serum, and the signal benefits that attend its use in some cases. I am sorry to say that so far we do not know in any given case whether it be one particular streptococcic infection or another. But we have a difference in the streptococci, and we have not a known serum which will antagonize or kill the poisonous effects wholly of them, but we have a serum which will certainly destroy the deleterious influences of some one or more of these germs.

I recently saw a woman with a temperature of 105°, pulse 140, on the fifth day after confinement, with a leaky skin, and all the symptoms of a person very ill. Investigation revealed the fact that the uterus was clean. The physician who had attended her had been careful; he examined the secundines and was certain he had a clean uterus. Our investigations revealed this at the time. We did not take time to settle the question as to whether we had a streptococcus, staphylococcus or colon bacillus infection, but we immediately gave the woman 10 c.c. of antistreptococcic serum, made by Stearns, and repeated it in eight hours. In twelve hours from the first infection the woman's temperature declined to 100°, and her pulse fell. I did not see her afterward, but within twenty-four hours it is said she had virtually

recovered. Her physician telephoned me that she had had no untoward symptoms whatever twelve hours after the first dose.

I believe it has been clearly demonstrated that the antistreptococcic serum is not attended with any ill results, and that oftentimes if we give it extensive use we will save some of these cases which, to say the least, are exceedingly heroic.

DR. WALTER B. DORSETT, Saint Louis.—I did not hear all of Dr. Gilliam's paper as I arrived a little late, but I did not hear anyone speak of drainage. I consider it one of the most effectual remedies we have, whether we use antistreptococcic or antidiphtheritic serum, as the case may be.

I was pleased to hear Dr. Gilliam's remarks in regard to the use of the curet, but am sorry to hear him say so much in favor of the use of the dull curet. I maintain the position I took several years ago, that if we are going to use a curet, we should employ a sharp one, and only for the purpose of lifting off the placental tissue from the wall of the uterus, in the hope of removing any necrotic masses that may be there doing harm. We cannot clean out the uterus with a dull curet. I have used carbolic acid and iodine. I have used iodoform after cleaning out the uterus thoroughly with a large-sized return-flow douche tube. I have swabbed the uterus out clean with iodine and carbolic acid, after which I have introduced a suppository of iodoform into the fundus of the uterus, and inserted a small drain of gauze, leaving it hanging in the vagina, but not out at the vulva, allowing it to remain for twenty-four hours, and repeating the same process or removing it, as the case may be. If the suppository has been properly prepared by the pharmacist, who is always instructed to boil the cocoa butter in making it, by leaving it in this way the iodoform melts in the interior of the uterus, and it has its inhibitory effect on the germs.

DR. GILLIAM (closing the discussion).—I have very little to say in closing the discussion, as there has not been any very material antagonism to the paper. Dr. Longyear's remarks were almost entirely in accord, only he places a great deal of stress on the different germs and on a microscopical examination of the germs, to all of which I agree, although I have learned from experience that it is difficult often to make out the character of the germ infecting the woman, from a microscopical examination of the lochia. The best pathologists and microscopists have failed, sometimes signally, to make out the character of the germ infection, and sometimes the germs have been found in the larger bloodvessels and in the peritoneum, where there were none to be found in the ordinary blood current that passes through the small vessels, and where they were not evident in any other part of the body. The lochia often gives negative results as to the character of the infecting germ. I believe I said in my paper that a microscopical examination of the lochia for germs is not always satisfactory, yet it is something we ought not to neglect. If we can satisfy ourselves of the presence of a deadly germ, such

as the streptococcus or the diphtheria germ, or other vicious germs, it will go a long way toward directing our treatment of the case; but it is the experience of the best men in the world that the time has not yet come when we can always determine the character of infection.

I heartily approve of the use of serum mentioned by Dr. Longyear, although it does not apply to a great many cases. Dr. Allaben speaks of iodine. I am not opposed to it. Personally I favor its use, but did not make special mention of it. It has a penetrating power we do not get from carbolic acid, or from some other agents.

I only admitted of the propriety of invading the uterine cavity under the conditions named in the paper, and a man should be capable of doing it without inflicting an injury or he should not undertake it. There are men doing obstetrical work who are absolutely filthy. I recall a practitioner who does a great deal of obstetrical work in our city, who happened in at an abdominal operation, dipped his hands in water, rubbed them a little, turned around and remarked, "I am aseptic, and in anything you want me to do, I will assist you."

Dr. Noble alluded to antistreptococcic serum. If this serum is absolutely harmless (I have seen it denied), I have no objections to using it if we can save one case out of twenty, or one case out of fifty; but if it is not harmless, the small number of cases benefited by it should make us cautious in using it. Still this may be regarded as a good suggestion, although I will say for myself that my experience and observation have been such as to make me feel incredulous as to the eligibility of this preparation.

Dr. Dorsett referred to drainage and the use of the curet. I am not much in favor of so-called drainage, or of putting gauze into the uterine cavity. Gauze is not a good drain. When I use gauze in my abdominal operations, I do not use it with the object of having it drain, because in a few hours it becomes clogged. Unless gauze is in the hands of Dr. Dorsett, or someone equally efficient, I would inveigh against the use of it in the uterine cavity in post partum infection, because I am afraid injury would be inflicted by the operator. If any of the germs get beyond a certain territory, they are met by the protective leucocytes and are killed, or so disabled that they are incapable of doing much harm. If a man introduces gauze into the uterine cavity, he must be very careful.

Another thing we want to remember: if we pack the uterus so that there is pressure upon it, it is the best way to produce invasion of the deeper structures. We know the germs under pressure penetrate into the tissues. If you have a bone felon a few drops of pus under the unyielding periosteum, under pressure, will force germs into the general system, and you will have general infection as a result. If you release tension, the infection

is reduced almost immediately. I would be careful about using gauze in the uterine cavity.

With reference to the sharp and dull curet, this is a question that has been discussed over and over again, but I know from personal experience I can clean the uterus with a dull curet, with a stiff handle much more efficiently and with much less damage to the epithelium than I can with a sharp instrument. You do not know how deeply the sharp curet is going to penetrate. You do not know whether you are shaving off the membranes or the epithelium, which is the safeguard against infection, when you use the sharp curet. The sharp curet shaves off the mucosa; with a dull curet you stand much less chance of conveying infection. If I were in doubt about a streptococcus infection, I would rather leave the whole placenta in the uterus and let it come away of itself than to introduce a sharp curet for the purpose of removing it. The saprophyte does not kill. I repeat, I would let the placenta remain to be cast off by nature rather than to use a sharp curet.

PENETRATING AND PERFORATING GUNSHOT AND STAB WOUNDS OF THE ABDOMEN, WITH REPORT OF CASES.

By JOHN YOUNG BROWN, M.D.,
ST. LOUIS.

It is generally agreed among surgeons that all penetrating gunshot and stab wounds of the abdomen should be treated by immediate section, with repair of all visceral injuries. A careful analysis of the statistics of Klem, Douglas and Parker will lead us to but one conclusion. True it is that the experience of those surgeons who served in the Spanish-American and Anglo-Boer wars led them to advocate the expectant treatment of such cases. It will, however, be difficult to convince those surgeons who have had any experience in the operative treatment of wounds of this character, that bullet wounds of bowel received in battle differ in any particular from the visceral injuries and peritoneal perforations inflicted in times of peace, and while, as Senn remarks, "there are many circumstances in military practice that militate against the propriety and feasibility of resorting to formidable surgical interference in such cases," he, however, strongly advocates prompt surgery in all instances in which, owing to the course of the missile, it is reasonable to assume that the bullet has made visceral injuries that would be almost certain to destroy life without surgical interference. The brilliant work of H. H. Grant, Richard Douglas, Mayo, Rodman, Vance, LaPlace, Ochsner, Louis Rassieur and others, leaves no room to question the advisability of prompt and thorough surgery in the treatment of these cases. The questions to be determined in the future are, not when to operate, but *how* and by what surgical methods we can best meet the indications in such cases. My opportunities for observing wounds of this character are exceptionally good.

At the St. Louis City Hospital, of which institution I have charge, we receive almost all of the gunshot injuries occurring in that city, and as St. Louis is a city of 700,000 people, we, perhaps, treat more of these cases than are treated at any one institution

in this country. During the last three months I have operated on quite an interesting series of cases, which I wish to report for your consideration, giving, in detail, the methods employed. This I can best do under separate heads.

Preparation of Patient.—When a gunshot or stab wound of the abdomen is received at the hospital, it is assumed that the wound is a penetrating one, until it is proven to the contrary; consequently the patient is immediately prepared with the same care as for a laparatomy; catheterization is done, the abdomen is shaved, scrubbed with green soap, washed with bichloride and alcohol, and when the preparations are complete, his wounds are examined to determine whether the bullet or knife has penetrated the peritoneal cavity. The wound of entrance is enlarged and the track of the bullet is traced with the sterile finger. The probe is never used, except to complete the investigation. Occasionally a case will occur where, even after cutting down to peritoneum, it is difficult to demonstrate penetration. This condition is often found where the wound is made by a bullet of small caliber. Here the probe is a valuable instrument. Case VI illustrates this point. This patient was brought to the hospital with small bullet wound through right rectus muscle, one-half inch below and to right of umbilicus. There were no evidences of shock. Pulse good and to all appearances the wound was an innocent one. Wound enlarged, but finger could not demonstrate penetration. Patient was anesthetized and wound opened down to peritoneum; with a probe a small opening in peritoneum was found. Section was immediately made and two wounds of small bowel repaired. This case is doubly instructive, in that it demonstrates the difficulty encountered at times in determining penetration, as well as the importance of demonstrating this point. Here was a wound, apparently a non-penetrating one, which proved to be not only penetrating but perforating. When a knife or bullet has penetrated the peritoneal cavity, there is but one method of determining perforation and that is, by means of an abdominal section and a careful investigation of the abdominal viscera. An extensive operative experience has taught me that this is the only safe course. I have time and time again opened the abdomen when all symptoms pointed to perforation and have, after thorough search, found no injury to viscera. Then again, I have operated, expecting to find no injury to bowel and have found anywhere from one to nine perforations. Section properly performed is safe and, like some of our election laws, leaves nothing to chance.

During the last three months we have had eight exploratory laparatomies for gunshot wounds, without death.

The hydrogen gas test of Senn, I do not consider safe. To distend a bowel injured in one or more places, fecal extravasation is bound to occur. When penetration is proven, section should follow as a natural sequence. In the majority of cases I have found a median abdominal incision most appropriate. The incision may be short or long; personally, I prefer a long incision. It may be below or above the umbilicus. In gunshot wounds it is wise to make an incision from the ensiform cartilage to umbilicus. The extent of injury done by a bullet can never be determined until the abdominal contents have been thoroughly gone over. In stab wounds, the location of the wound should govern us, both as regards length and situation of abdominal opening.

Search for Visceral Injuries.—I cannot emphasize too strongly the importance of systematic search for visceral injuries. Success in the treatment of these cases depends on the thoroughness with which the surgery is done. To repair three or six wounds of bowel and leave one, defeats the purpose for which the operation was performed. The following case will illustrate this point:

Frank M., (Col.) was admitted to hospital suffering from gunshot wound of the abdomen. Examination showed bullet to have entered right ileum one inch behind anterior superior spinus process. Patient was shot twenty-eight hours before coming to hospital. After the injury, he walked two miles, got a wagon, drove to nearest town and was brought to St. Louis on train. When admitted to hospital he gave evidence of widespread peritonitis. Pulse rapid; temperature 103°. He was prepared at once for section. On opening the abdomen the peritoneal cavity was found to contain considerable blood and bowel contents. A number of grains of undigested corn were found scattered between coils of intestines. The peritonitis was widespread. A wound in the cecum was repaired. Four wounds of small bowel, in close proximity, were found. Six inches of small bowel was resected and an anastomosis made with Murphy button. The peritoneal cavity was flushed and drained. Patient died in twenty-four hours of peritonitis. Autopsy showed leakage from overlooked perforation in cecum. The Murphy button union and the wound in the cecum were tight.

While it is probable that this patient would have died, even if perforation had not been overlooked, it nevertheless emphasizes the importance of careful search for all bowel injuries. It is

our custom, in all cases of gunshot wounds of the abdomen, to examine the viscera in the following manner: the stomach is examined fore and aft; the liver and spleen are then gone over. Beginning at the angle of Tritz, the small intestine is followed to ileocecal valve. The ascending, transverse, descending colon and sigmoid flexure are then examined. A systematic search of this character precludes the possibility of overlooking injuries to peritoneal contents.

Control of Hemorrhage.—Injuries to vessels of mesentery and omentum can be readily controlled by ligature. Hemorrhage from liver, pancreas and spleen are, in some cases, hard to manage either by ligature or suture. In such cases, a properly applied gauze pack should be used. The following is of exceeding interest and demonstrates how difficult it is in many cases to control hemorrhage:

Mandy B., age 28 years, was admitted to hospital suffering from stab wound of the abdomen. Knife entered outer border of left rectus muscle, on level with eighth rib. Wound traced and found to have taken a slanting course and to penetrate. Patient was suffering considerably from shock. She was immediately anesthetized and abdomen was opened. On opening peritoneum, the hemorrhage was found to be profuse. An incised wound of the lower border of left lobe of liver was found and closed with two silk sutures. There was marked gastroptosis. The knife blade was found to have grazed the upper border of pylorus, cut through gastro-hepatic omentum and entered head of pancreas. The hemorrhage from this source was alarming. An effort was made to control this with ligature, and by tying *en masse*, was partially successful. Careful gauze packing stopped the bleeding completely and the patient made an uneventful recovery. There are a number of interesting points in regard to this case which I will fully discuss in a future article.

Irrigation and Drainage.—I am a great believer in the virtues of irrigation and drainage in the treatment of wounds of this character. Normal salt solution is invariably used and used in large quantities. The apparatus is the flush tube and funnel of Price. The objects to be obtained are: (1) to cleanse the peritoneal cavity; (2) to combat shock. To accomplish the first purpose, the irrigation should be thorough. The region of the liver, spleen, both iliac regions and the pelvis are flushed until the irrigating fluid returns clear. This, as a rule, is done at the completion of the operation. In cases where the shock is great, it

is my custom to fill the peritoneal cavity with salt solution as soon as the abdomen is opened. The solution is rapidly absorbed and it is remarkable how quickly the pulse will respond.

Regarding drainage, I believe that in all cases where there has been a solution of continuity of bowel, the drain should be used. It may be of glass, gauze or rubber. I use, as a rule, the gauze wicks and endeavor to bring them out through the wound of entrance. If the incision extends sufficiently low, a glass drain is placed in the pelvis. Before closing the abdomen, the omentum should be carefully spread over the intestines.

Closure of Incision.—As the incision in these cases is generally a long one, the greatest care consistent with rapid work should be exercised in closing it. If the condition of the patient permits, the wound should be closed with buried suture; otherwise with through and through sutures of silkworm gut. In order to prevent post-operative hernia, the laparatomy wound should be completely closed and the drains brought out either through the wound of entrance or through a puncture made for this purpose.

The following cases I will briefly report:

PERFORATING WOUNDS OF INTESTINES.

CASE I.—Wm. O. Patient was admitted to the hospital suffering from stab wound of the left side, knife entering at lower border of twelfth rib, one inch to left of mammary line. Wound was traced and found to penetrate peritoneal cavity. Patient was immediately prepared for section. An incision was made in median line extending from one inch below ensiform cartilage to one inch below umbilicus. On opening the abdomen, the peritoneum was found filled with beer, spaghetti and blood. On examining the stomach, a wound was found in anterior wall from which contents of stomach was freely escaping. Stomach wound was immediately closed with through and through sutures of silk, which were buried by a row of Lembert stitches. Systematic search was made for other injuries to viscera, but none was found. Abdominal cavity was freely flushed with five gallons of normal salt solution. A drain was introduced through original stab wound and median incision was closed with buried silk for peritoneum and fascia and silkworm gut for skin. In this case, although the stomach was perforated and abdomen was full of blood and stomach contents, there were no evidences of perforations revealed prior to section. Before patient came out

from anesthetic, the stomach was washed out with stomach tube. Recovered.

CASE II.—Wm. W. Patient was admitted to hospital suffering from gunshot wound of the abdomen. Bullet entered abdominal cavity on left side, three inches to left and one inch above umbilicus. Wound was traced and found to be penetrating. Abdomen opened. Six-inch incision extending from one inch below ensiform cartilage to umbilicus. Usual search was made for visceral injuries. Seven perforations of ileum were found, which were closed with through and through sutures and buried with Lembert sutures. Peritoneal cavity flushed with five gallons of salt solution. Two gauze drains placed. Wound closed with through and through sutures of silkworm gut. Recovered.

CASE III.—Laura P. Patient was admitted to hospital suffering from gunshot wound of abdomen and right forearm. Bullet entered abdominal cavity three inches to right of median line and one inch below umbilicus. Wound traced and found to penetrate peritoneal cavity. She was immediately prepared for section. Median incision was made, six inches in length, extending one inch below ensiform cartilage to one inch below umiblicus. Examination revealed two perforations of small bowel, which were closed with through and through sutures, buried by Lembert sutures. Peritoneal cavity flushed with hot salt solution and gauze drain placed. Incision closed with through and through silkworm gut. Patient made uninterrupted recovery.

CASE IV.—Lucille M. (Col.) Patient was admitted to hospital suffering from gunshot wound of the abdomen. Bullet entered right rectus muscle one-half inch to right and above umbilicus. Patient had been drinking freely prior to admission. Bullet wound traced and found to penetrate peritoneal cavity. Patient suffered little from shock and there were absolutely no evidences of penetration. Bladder was catheterized and urine contained no blood. She was immediately prepared for section. An incision, six inches long in median line extending from one inch below ensiform cartilage to one inch below umbilicus, was made. On opening peritoneal cavity, quite a good deal of blood was found. The stomach was examined, fore and aft, and no perforation found. Beginning at the angle of Tritz, the small intestine was gone over. Nine perforations were found in small bowel. Six inches of small bowel resected and anastomosis made with Murphy button. Three other perforations were repaired with through and through silk sutures buried by interrupted

Lembert sutures. The ascending transverse and descending colon and sigmoid flexure were then examined and found to be intact. The peritoneal cavity was copiously irrigated with five gallons of normal salt solution. A glass drain was placed at lower angle of wound and a small gauze drain through wound of entrance. Incision closed with through and through silk suture. Usual dressing applied. Patient was put to bed in fairly good condition. Time of operation 65 minutes. Patient recovered.

CASE V.—Wm. L. Patient entered hospital suffering from stab wound of the abdomen. Knife entered abdominal cavity in right iliac region, midway between anterior superior spinous process of ileum and umbilicus. Patient gave no evidence of perforation. Wound traced and found to penetrate peritoneal cavity. Section made immediately after usual preparation. Incision in median line, four inches in length, extending from umbilicus to one inch above pubes. Four perforations of small intestine were found and repaired with through and through sutures of silk, buried by a row of Lembert sutures. Cavity flushed with hot salt solution. Gauze drain. Wound closed with through and through sutures of silkworm gut. Patient made uninterruped recovery.

CASE VI.—Chas. W. Patient admitted August 24, suffering from gunshot wound of the abdomen. Bullet entered right rectus muscle one-half inch below and to right of umbilicus. There were no evidences of penetration or perforation. Wound of entrance enlarged, but finger was unable to demonstrate peritoneal penetration. Patient was anesthetized and wound further enlarged and retractor introduced. After careful search, peritoneal penetration was demonstated with probe. On opening abdomen, there was considerable blood in peritoneal cavity. The usual search was made for intestinal perforations. Two perforations were found in small bowel and closed with a double row of Lembert sutures. Peritoneal cavity was copiously irrigated with hot salt solution and wound was closed with layer sutures of silk. No drainage. This case was interesting in the extreme, as the patient gave no evidences of penetration or perforation, and it was only after a free division of tract down to peritoneum and the introduction of retractor that the penetration of peritoneal cavity was demonstrated. The dressings were of dry gauze and the usual binding.

August 26th.—Forty-eight hours after section patient developed symptoms of intestinal obstruction. Abdomen was opened. Ow-

ing to close proximity of wounds in small bowel, it was found that lumen of gut was contracted. Quick resection was made with Murphy button. Cavity irrigated. A drain placed in upper angle of wound. Incision closed. Patient did well up to September 3rd, when he developed pneumonia. Died september 6th. Autopsy showed Murphy button loose in bowel; union perfect. No evidences of peritonitis. A small fecal fistula was found in upper angle of wound; result of agglutination of bowel to line of peritoneal incision. No leakage into peritoneal cavity.

CASE VII.—Will J. Patient entered hospital suffering from gunshot wound of right shoulder, left arm and wrist; also gunshot wound of abdomen. Bullet entered abdomen above umbilicus, one inch to right of median line. Bullet traced and found to penetrate peritoneal cavity. Patient vomited a considerable quantity of blood and was suffering from shock and gave evidence of severe internal hemorrhage. Section was done immediately. On opening the abdomen in median line, quite a quantity of blood was found in peritoneal cavity. Search revealed a huge tear in transverse colon; extensive injury to mesentery and omentum. Bowel contents, consisting of beer, etc., free in peritoneal cavity. Hemorrhage checked and quick resection of transverse colon made with Murphy button. Cavity flushed with hot salt solution. Gauze drain placed. Patient returned to bed. Patient died of shock three hours after operation. This case was very unpromising from time he entered hospital and surgery held out to him little hope.

CASE VIII.— Frank M. (Col.) Patient was brought to hospital suffering from gunshot wound in right ileum. He was brought in from the country, having been shot the night before, and when admitted, his abdomen was distended. Temperature 103°; pulse 140. He was immediately prepared for section. Six inches of small bowel resected, in which four perforations were found. Anastomosis made with Murphy button; wound in cecum closed. Patient died forty-eight hours after operation. Autopsy showed leakage from undiscovered wound in small bowel. The other wounds showed no leakage. Murphy button union tight. This patient was suffering from widespread peritonitis when admitis to hospital. The peritoneal cavity was full of bowel contents; a number of grains of corn being found. Although a careful search was made for bowel injuries, one was overlooked. This was due to the congested condition of bowel and to the desire on my part to finish the operation quickly, owing to bad condition of

patient. The autopsy was interesting, in that it showed the Murphy button union was tight; also, the wounds closed with the sutures. The case was unpromising from the beginning and perhaps would have died if the perforation had not been overlooked.

CASE IX.—Matheu L. Patient was admitted to hospital at 1:25 A. M., suffering from gunshot wound of the abdomen. Bullet entered right rectus muscle, one-half inch to right and one inch above navel. Patient was suffering from shock and gave evidence of internal hemorrhage. Bullet wound was traced and found to penetrate peritoneal cavity. Patient was immediately prepared for section. Incision made in median line, six inches in length, extending from one inch below ensiform cartilage to one inch below umbilicus. Examination revealed eight perforations of small bowel, all within an area of nineteen inches. Bowel resected with Connell suture, nineteen inches of gut being removed. Considerable bowel contents free in peritoneal cavity. No other visceral injuries discovered. Abdomen freely flushed with hot salt solution. Wound closed with through and through silkworm gut sutures. Patient died forty-eight hours after section. General peritonitis.

WOUNDS OF LIVER.

CASE I.—James McC. C. Patient was brought to hospital suffering from stab wound of the abdomen. Knife entered epigastric region through right rectus muscle. Patient showed no evidences of shock. Wound traced and found to penetrate peritoneal cavity. Patient prepared for section in the usual manner. Incision made in median line, six inches in length, extending from one inch below ensiform cartilage to one inch below umbilicus. Stomach and intestines examined; no perforation. Incised wound of liver was found, which was closed with two silk sutures. Blood sponged out of peritoneal cavity. Wound closed without flushing or drainage. Patient made uninterrupted recovery.

CASE II.—Fannie D. Patient admitted to hospital suffering from stab wound of the abdomen. Knife entered one and one-half inch below ensiform cartilage, slightly to left of median line. Wound traced with finger and found to penetrate. Patient was immediately prepared for section. Six inch incision was made in median line, extending one inch below ensiform cartilage to one inch below navel. On opening peritoneal cavity, abdomen was found filled with blood. Abdominal contents carefully gone over, but no injury to intestine found. Incised wound in liver

was discovered, from which the hemorrhage came. Wound was packed with gauze, which controlled the hemorrhage. Cavity flushed with hot salt solution. Abdomen closed. Patient made uninterrupted recovery.

CASE III.—Al S. Patient admitted to hospital suffering from two stab wounds of abdomen. Knife entered on left side in axillary line at border of eleventh rib. Omentum was found protruding from this wound. A second wound on right side one and one-quarter inch to left of mammary line in tenth interspace. Patient was prepared for section. Incision was made in median line extending from one inch below ensiform cartilage to one inch below umbilicus. On opening abdomen, peritoneal cavity was found filled with blood. A wound was found in the liver, right lobe, which admitted one finger. Hemorrhage was quite free. Wound was immediately plugged with gauze and gauze brought out through wound of entrance. This controlled the hemorrhage. Systematic search was made for other visceral injuries, but none were found. Copious irrigation with salt solution was then made and incision closed with buried sutures—silk for peritoneum and fascia, and silkworm gut for skin. Patient left table in fair condition. Recovered.

CASE IV.—Harry D. Patient was admitted to hospital suffering from gunshot wound of the abdomen. Bullet entered right side, border of ninth rib, two and one-half inches to the right of median line, radiating down and outward. Wound traced and found to be penetrating. Patient was immediately prepared for section. Median incision was made six inches in length, extending from ensiform cartilage to one inch below navel. Wound in right lobe of liver was found; hemorrhage quite free. Wound packed with gauze and hemorrhage checked. No injury to other viscera. Gauze drain inserted and abdomen closed with through and through sutures of silkworm gut. Patient had uneventful recovery.

CASE V.—Wm. B. Patient admitted to hospital suffering from gunshot wound of the abdomen. Bullet entered left rectus muscle one-half inch below border of ribs. Wound traced and found to penetrate. Patient was suffering greatly from shock. Pulse rapid and feeble. He was hurriedly prepared for section. On opening abdomen, hemorrhage was found to be terrific. Source of hemorrhage was from liver; left lobe containing large bullet wound. Hemorrhage was partially controlled by gauze plugging.

No other visceral injuries discovered. Patient never reacted from shock, but died three hours after operation.

An analysis of the above report shows nine cases of perforating wounds of intestines, with six recoveries and three deaths. Of the deaths, it will be seen that one was due to shock; the injuries being so extensive that patient never reacted. The second case entered hospital with general peritonitis, and while a perforation was overlooked, it is probable that the result would have been the same if this injury had been repaired. The third case should have been saved.

Of the wounds of the liver, five cases in all, four recovered and one died. This case died three hours after operation from shock, the result of hemorrhage.

Wound of pancreas, the case recovered.

To these cases I wish to add eight cases where laparatomy was performed and no injury to viscera found. This makes a total of twenty-three cases, with nineteen recoveries and four deaths.

DISCUSSION.

DR. WILLIS G. MACDONALD, Albany.—I apprehend that no great difference of opinion will exist in relation to the methods employed by Dr. Brown in this very interesting group of cases, with such excellent results. When it comes to the purely clinical part of his paper and the description of his cases, the plan of treatment which he employed agrees with my own ideas. I see nothing in the entire paper that is open to criticism, but when he makes the preliminary statement that the conditions are similar in any respect in dealing with gunshot wounds in military practice to those in civil practice, I want to enter at once, a very distinct dissent. The conditions of the well regulated hospital, even of the private house and the home, are very different from those secured on the battle field. You will not be able to do abdominal sections in military surgery in hospitals with any very great advantages. The question of transport from the field will very often involve the first twelve hours before it is possible to get the patient out of the range of active firing. The immense distances covered by the modern rifle compel us to put the field hospital at a considerable distance from the firing line. Mauser bullets are not great respecters of the Red Cross, though it may be some little distance away, and generals in command of the armies are likely to take advantage of position, and about the time you are ready to do an abdominal section, for the relief of a gunshot wound of the abdomen, the bullets may be coming over your way, and that is

about the time you would try to get behind a ridge. Personally, I have never been on the battlefield, but in my day I have been about as near as a great many surgeons, and I know that in the month of July, 1898, with the appliances afforded by the armies of the United States in the south, that in none of the state camps could abdominal surgery have been successfully done with any great percentage of cure. I saw men come from Santiago who had on the primary dressings of the battlefield. I saw them on the tenth and twelfth days of July, eight or nine days after they had received their wounds, where there could be no question as to the point of entrance, or the point where the bullet left the body, but there had been penetration of the peritoneal cavity. One of these men came north inside of two weeks without any disagreeable symptoms. Another one presented evidences of plastic peritonitis more or less, so that the evidences at one time seemed clear enough to open up apparently a localized inflammatory focus. Those men who were operated on just after the battle uniformly died. I know of two men who recovered from similar wounds, one of whom was subsequently killed in the Chinese expedition.

Now, that situation confronts us, and until we can reform our materials, collect and assemble things in such a way that we can apply them to military practice, when we open the abdomen, we are going to expose our patients to greater dangers than they knew. I have been in places where I could not get enough water to wash my hands, let alone sterilize them to put on rubber gloves. A rubber glove put on in the open field alongside the patient on a stretcher is no better than an ungloved hand.

In civil practice the character of the gun is entirely different. In the last strike which we had in the city of Albany, in a mix-up between the crowd and the militia, two men were killed, both of them having been struck by a 38 Colt. I saw both of them. One man was shot perhaps at a distance of thirty feet. The wound of entrance in his abdomen allowed the head of the cecum to come through without any change at all. This came directly through the open wound. He had numerous perforations of the small intestine. He was shot through the sigmoid, and the bullet went directly through the ileum, penetrating it, and lodging in the soft tissues on the outside of the thigh. The other man received a gunshot wound in the epigastrium which broke the left lobe of his liver all to pieces, if you please, shot away his gall-bladder, wounded his stomach, and tore up a distance of from four to six inches of the colon, before it passed out of the body.

You cannot compare wounds sustained in civil practice, that are made under ordinary conditions with those which you are going to see associated with the mob, made by bullets of larger caliber. These bullets make large wounds. A 22 or 30 Mauser simply makes a perforation frequently which is closed practically by mucous membrane, and if men have their intestinal canals entirely empty when wounded by the high power guns,

frequently a considerable number of them will recover, even though they have no surgery. But suppose, again, you are able to do abdominal surgery, the matter of transport in the next thirty-six hours will present itself to you, and the fact of transport is going to materially and seriously affect these patients. So, aside from the differences which I conceive to be those in military practice, there is nothing but commendation for the excellent paper of Dr. Brown.

DR. EDWIN RICKETTS, Cincinnati.—We have in this series of interesting cases two things for consideration, and the most important one to my mind, is the suture made use of and the union that results following the use of the Murphy button. As has been stated by the essayist, we can readily see in the specimen presented where union has taken place after the application of the Murphy button, and we can readily see the objections to the Connell suture in the other portion of the specimen as pointed out by the essayist.

In a patient in whom intestinal anastomosis was performed last June in the small intestine, an inch and a half being removed, the Murphy button was used, and passed on the seventh day without any bad symptoms following.

I agree with the essayist that in this particular class of cases, the rapidity with which you can make use of the Murphy button in doing the anastomosis is so great and so perfect, that there is no comparison whatever in an anastomosis made by the Connell suture. While the Murphy button has not been used to the extent that it was in the past five or six years, these cases reported by Dr. Brown, and other cases that have been reported, are proof sufficient to convince us that the Murphy button is bound in the future to be used more than it has been in the past.

DR. JOHN B. MURPHY, Chicago.—The paper of Dr. Brown has interested me very much. I could not help but notice the frequency of the sentence, "made an uninterrupted recovery," as contrasted with the records of similar cases reported twelve and fifteen years ago, when the sentence usually read, "went on uninterruptedly to death." Let us contrast the situation and we find it is due to a number of important points in the management of the cases. First, the control of the hemorrhage which the essayist has already impressed upon us. The second, overlooked perforation. This is avoidable, although I am sorry to admit that I had a case within two years in which I overlooked three perforations of the bowel because I thought I knew so much about the subject. I felt that the bullet going in a certain direction, and entering the abdomen in a certain place, could not possibly touch, or penetrate the small intestine. However, a post-mortem made at the Coroner's request, showed that it did, and I felt much chagrined. This should not occur and it will not occur if we take the proper precautions, in regard to the large or fixed portion of the intestine,—and I speak of it as fixed, except the sigmoid flexure,—this may be on the right or left side. When we have a

wound in the lower portion of the abdomen, it is unnecessary to pass the large intestine through the hand. It is necessary to pass every inch of the small intestine from the beginning of the jejunum at the ileo-cecal valve through the hand, when the bullet has passed through or into the abdomen. It can be done readily without much danger and in a few moments. The intestine can be passed quickly through the fingers without bringing it out of the abdomen. It is unnecessary and grossly dangerous to eviscerate the patient. I cannot impress upon your minds too forcibly the passing of intestines through the hand, on account of the painful results I have had by believing I could determine what portion of the bowel was not injured by a bullet passing into the abdomen.

Irrigation in this class of cases is tolerable, because we have the contents of the intestinal tract in the free cavity. The cavity does not need to be washed and cleaned as thoroughly as possible, as we have been taught, if we properly drain.

The next element of importance is the closure of the abdominal cavity with or without drainage. I believe the drainage is safer. Drainage should be instituted in the most dependent portion of the cavity when the patient is placed at an angle of forty-five degrees in the sitting posture, namely, in the pelvic. It should be rubber or glass, not gauze.

Next is the matter of the treatment of the patient after operation. The patient usually has distention of the intestines on account of paralysis from infection and manipulation. I am speaking now of paralysis of peristalsis. How can we best treat the patient afterwards? He is absorbing toxic products in his peritoneal cavity, and I think we can best treat him by continually filling his large intestine, getting the patient so that he will take in eight hours, eight pints of fluid, and absorb it from the large intestine. I believe the greatest advancements in overcoming an immediate primary and fatal dose of sepsis in peritoneal infection is met by the suggestion of filling the large intestine with liberal quantities of water, that is, by placing the syphon syringe a foot or two above the level of the patient's bed, and securing the rubber tube in the bowel with adhesive plaster, and allowing the water to seep in. If you get more than a certain quantity in a limited time, rectal tenesmus will force it out. It is the slow admission of this water which enables it to become rapidly absorbed and carries the patient over the critical period.

Dr. M. Stamm, Fremont, Ohio.—As a preliminary step to an abdominal operation, I would explore the clothing and the shoes of the patient in all cases of gunshot wounds. I recall the case of a man who was shot in the right hypogastric region. An exploratory incision was made, but no perforation was found. Within half an hour after the operation the bullet was found in a boot of the patient.

Dr. Brown (closing the discussion).—In regard to dealing with cases of this character in military surgery, I concur in the

remarks made by Dr. Macdonald, that the conditions are entirely different from what we find them in hospital practice. The point I desired to make was not to criticise the treatment that has obtained in military practice, but to emphasize how unreliable statistics of that character are. We have recently had a published series of statistics in which military surgeons have claimed time and again that patients with penetrating and perforating gunshot wounds of the abdomen have recovered. I cannot for the life of me see how an assertion of this kind can be made unless perforation has been demonstrated by abdominal section. My own experience in dealing with these conditions has demonstrated this to me conclusively. I have time and again opened the abdomen when everything pointed to a perforation, and I felt confident that I would find one, and yet none was found. Again, I have opened the abdomen, thinking perhaps I would not find perforation, and have found anywhere from six to nine perforations.

The mortality in cases of this character is entirely too high, and I think the reason of it is due to the fact that practitioners are prone to accept such statistics as have been furnished us by military surgeons. Their statistics relative to the nature of the injuries are speculative. If men with these wounds are gotten into the hands of surgeons early, and prompt, thorough surgery is done on them, then I do not see why the mortality should not be materially reduced. The time of the operation in these cases is by long odds the important factor.

You will remember that we had a most illustrative case of this character occur in my native State, Kentucky, where one of our prominent citizens was shot in the intestines. Just prior to this shooting, Dr. Barrow, a Fellow of this Society, did a resection of the bowel and closed nine gunshot perforations, with a successful result. Instead of sending for Dr. Barrow, they sent to Cincinnati for a distinguished surgeon, and by the time he arrived the patient had widespread peritonitis and was beyond the reach of surgical aid. If these patients are allowed to wait, the mortality will continue to be large.

It is difficult, as I emphasized in my paper, at times to demonstrate penetration. In the case cited in my record the wound, which seemingly was apparently innocent, was made with a small bullet. There was no evidence that penetration or perforation had occurred. Careful investigation of the wound of entrance demonstrated that the bullet had not only penetrated but perforated the intestine. Cases of this character are frequent. Left alone, they all die from peritonitis. I cannot believe that patients with perforating wounds of the abdomen get well without operation, judging from the experience I have had, and if perforation is suspected it is mandatory that an immediate operation should be done.

There is a class of gunshot wounds of the abdomen, one or two of which I cited in my paper, that no abdominal work will save.

These patients are bleeding. They are shocked. They are going to die, and, as a rule, you can tell this whenever they come under your observation. I cited a case where the whole transverse colon was blown off, and I had no hope of saving the patient, yet I felt he was entitled to the chance that surgery offers. I operated, but he died.

If there is a hole in the bowel, the result of a typhoid ulcer or perforating gastric ulcer, or by a bullet, there is but one course to pursue, and that is to immediately open the abdomen and repair the wound.

In the after-treatment of these cases, I fully concur with Dr. Murphy in what he has said relative to the injections of water into the large bowel. I prefer salt solution. It is my practice to give the treatment he recommends. In regard to morphine, I am strenuously opposed to the use of this drug in abdominal work.

INFANTILE UTERUS, SCANTY MENSTRUATION, AMENORRHEA AND DYSMENORRHEA CURED BY STEM PESSARIES.

By J. H. CARSTENS, M.D.,
DETROIT.

WHEN I was in general practice the most difficult and troublesome cases I had were those of poorly developed uteri with all the accompanying symptoms, and cases of scanty menstruation, especially in fat women with more or less painful flows caused by recurring stenosis. I of course treated them in the then orthodox manner; glycerin tampons, hot injections, painting the vault with iodin, gradual or repeated dilatation, with electricity, and all the nauseant emmenagogues that had been handed down to us for ages, and from which I never got any result. Finally the patients would drift away and then become subject to a similar course of treatment in other hands. I have tried all the new modes of treatment suggested and the wonderful new remedies so greatly lauded, but all around they never availed. It was the same old story. The one streak of light I had with these cases was when by a peculiar combination of circumstances the married patients accidentally became pregnant. This would bring about such a wonderful change in the pelvic organs that they were not troubled in the future. Sometimes some of the girls would get married and the changed life would bring about relief.

Thirty years or more ago we occasionally used stem pessaries for the purpose of curing displacements. Velpeau was the first, I think, who urged this treatment, in 1840. Simpson and others took it up. Finally there were advocates and opponents of the use of stem pessaries. As rupture in pus tubes and pelvic inflammation was caused, or if latent aroused to virulence, and as also infection was often introduced with it, in the course of time the stem pessary was discarded or was rarely used. Thomas in his classical book has given a most perfect description of it. He recognizes the danger of pelvic inflammation and warns against it, but recommends the stem in some cases.

I have looked over a great many of the newer text-books, and in hardly any of them do I find it mentioned. I will not trouble you by quoting from the different authors who mention stem pessaries or who do not and which are matters of history. I simply give you my reason for using the stem pessary in selected cases and you can judge of the value of this method of treatment in some troublesome cases by trying it yourselves.

Many years ago I saw in a medical journal a recommendation to introduce a string of beads into the uterus in order to stimulate menstruation. I never tried it and am sorry that I could not find the article, but at that time it impressed me as plausible. It occurred to me, why not use a stem pessary for that purpose? I used it with a large number of cases with success. However, as I gave up general practice and limited myself to a specialty I see few cases except very intractable ones, and those in consultation. And in those cases I have used stem pessaries, probably two or three a year. Finding good results, I naturally extended the use in cases with different symptoms, and for different pathologic conditions. I originally used the stem simply to stimulate menstruation where it was scanty or would only occur every three or six months.

When the question of infantile uteri was brought up it occurred to me that here was a class of cases where it ought to do good, especially as I had failed to give any benefit by the usual methods of treatment, including the much lauded treatment by electricity. I found that after the use of the stem the uterus would enlarge and develop firmly and menstruation become established. My theory was, that not only was the uterus stimulated and congestion produced, but that the nutrition of all the pelvic organs would be increased and the patient relieved.

Those other peculiar cases where the uterine canal is tortuous, cork-screw like, or with a stricture at the internal os which soon recurs after dilatation, I have found also relieved by introduction of the stem pessary for six months or a year. The uterine canal would become patulous and remain so.

My theory of the action of the stem pessary is based on the physiologic development of the muscles by exercise. Poorly developed muscles can only be made strong and large by exercise, although some people think they get strong by rest, which is a great mistake. Athletes develop muscles, not by rest, but by the most strenuous exertions. The small uterus can only be made large and normal in the same manner; the uterus can only

be exercised by putting some foreign substance into it. As the tendency of the womb is to expel all foreign contents, it exercises itself to get rid of the foreign substance and thus it gets strong and large. This principle should underlie the treatment.

The old way of treating these cases by massage with electricity is not sufficient. By putting something into the uterus the whole muscles of the uterus contract; during the first day or two it may be with pain like in labor, but after that the pain ceases and the patient does not know she wears a pessary. The greatest trouble I have had is to keep the pessary in. I have tried various kinds, but finally came to the Chapman pessary, which I have used for a good many years, and very seldom find one that cannot be retained. It is hard rubber, hence can be boiled to sterilize. It contains two blades which spread apart and hold it in place. They must be introduced by a special instrument and when the latter is withdrawn the two blades separate and the stem will not fall out. I then introduce a Thomas Hodge retroversion pessary as a special safeguard.

In some cases of retroversion this is a most excellent way of treating them. The introduction of the instrument is painful; hence you must use an anesthetic in nearly every case. As a rule, I take my patient to the hospital and prepare her with the same care and detail as in other operations. Introduce the instrument, which will only take a few minutes, and keep her in bed that day, perhaps even another day. Then allow her to get up and move around, and in three or four days she can leave the hospital and attend to her usual vocation. I allow the patient to do anything and everything—riding bicycles, traveling—in fact, she never knows she has a pessary in her. Every month or two I have her report. People living at a great distance only have to report every six months. The pessary does not interfere with coition.

Naturally the diagnosis must be perfect. *There must be absolutely no inflammatory pelvic trouble* either acute or latent. If there is ovarian or tubal trouble, other treatment, or operation, is necessary.

CASE I.—Miss L. C., aged 23; senior nurse; painful and irregular menstruation 6 to 8 weeks. Uterus 2¼ inches. Introduced stem pessary November 27, 1900, and menstruation became regular and more profuse. When she graduated it was perfectly normal. She retained the stem pessary and left the city, nursing

in Canada, New York, and different parts of the country, being always perfectly well. She returned August, 1902, nearly two years afterwards, the picture of health, and thought it was about time to remove the pessary, which I did. I saw her last week a year after I removed the pessary, and she was in perfect health and menstruation perfectly normal.

CASE II.—Miss R. H., aged 19; introduced stem pessary June 19, 1901; menstruation became regular and eight months afterward, January 31, 1902, I removed the stem. She was apparently in perfect health.

CASE III.—Miss A. F., aged 24; painful menstruation, very scant, lasting only one-half to one day, occurring every six weeks to three months. She was very fat. I introduced the stem pessary September 9, 1901. She returned to her home a hundred miles from Detroit. As she had to go to New York on business every six months, she always stopped over here on her way. She was very much relieved in six months; as menstruation became regular and more normal, although still scant, I told her that we would leave in the pessary and she continued to wear it for two years. I removed it August 29, 1903. She had lost a good deal of flesh; menstruation was perfectly normal, lasting four days. She was in perfect health, as she expressed it herself, "she never felt better," attributing the good results to the use of the stem pessary. Naturally I agreed with her.

CASE IV.—Miss E. B., aged 24; large girl with irregular, scanty, and painful menstruation. I introduced the stem pessary June 21, 1902. She went to the seashore of Massachusetts, leading an active society life. She developed a great deal of pain and evidently some pelvic inflammation started up. She telegraphed to me asking advice, and I told her to send for a physician in Boston, who would remove the pessary, and she did so. She still has some slight trouble with menstruation, but is in good health.

Having treated many individuals with benefit I urge the profession to try the stem in selected cases. Pelvic inflammatory disease of any kind must be absolutely excluded. No after treatment is necessary, not even douches need be given.

I will recommend this plan of treatment in the following kinds of cases:

1. Infantile and poorly developed uteri.
2. Amenorrhea.
3. Scanty and irregular menstruation as found in fleshy women.

4. Simple cases of retroversion in young girls.

5. Cases of stenosis or tortuous uterine canal.

6. The stem must be worn at least six months. A year or even two years is better. If at any time irritation is produced, the pessary can be easily removed.

DISCUSSION.

DR. FERNAND HENROTIN, Chicago (by invitation).—If I were to give any definite ideas in this class of cases, and was called upon for advice in a general way, I should say, "Don't do it."

However, in the right place, under the right circumstances, with the right case, the right man, and the right surroundings, it is a form of treatment which is based on commonsense, and frequently succeeds. The possibilities of harm resulting from this form of treatment are so numerous that I need not dwell upon them in the presence of gentlemen who are so well informed.

The report of the cases given by Dr. Carstens indicates that the Michigan women are really a very healthy class, and that they can stand going around wearing a uterine stem without any harm, but it will not avail universally. The facts are that we recognize the dangers of this form of treatment. When a man has had considerable experience, and has his patients under good control, the treatment may be worthy of trial.

DR. CHARLES L. BONIFIELD, Cincinnati.—Dr. Carstens has told us that the only way to develop the muscles is to exercise them. The only way to develop a man is to work him. The theory on which he bases his treatment is absolutely correct, and that he obtains results in these cases I have not the slightest doubt. However, I have been afraid to use the stem pessary, and have tried to secure results by other methods. The manner in which I have tried to exercise the uterus is by thoroughly dilating the cervix, and packing it as tight as possible with iodoform gauze, so tightly, indeed, that very frequently the gauze is expelled. The results from this treatment I admit are not so permanent as those secured by the use of the stem pessary, but the method is less dangerous. In my experience it has often been necessary to curet cases two or three times, at intervals of from six months to two years. Sometimes I have been able to prolong the benefits derived from curetting by inserting a small wisp of iodoform gauze once or twice a month thus stimulating the uterus to contract. Of course, one must thoroughly sterilize the vagina as well as the cervical canal before he introduces the iodoform gauze. I believe the stem pessary is invaluable in a certain number of cases, and the man from whom I learned most of my gynecology (Dr. Reamy) had occasion to use the stem pessary at times, but personally I have never employed it.

DR. H. W. LONGYEAR, Detroit.—Dr. Carstens is to be congratulated on his good fortune in the cases reported. I am sure if I had used the stem pessary in as many cases, and had allowed my patients to go out of town, I should have expected more than one woman to have suffered, necessitating removal of the pessary by another physician. I have had a self-retaining stem pessary made of silver, which is easily introduced, causes little irritation (I have exhibited it before this Association) and I use it in the class of cases discussed by Dr. Carstens, but I would not allow the patients to pass from my observation, and I always tell them they must come back soon and not leave town. Any stem pessary is liable to produce irritation, even severe inflammation of the parts, without any infection being present, and should be used with great caution.

DR. D. TOD GILLIAM, Columbus.—The great majority of cases in which we have disordered menstruation are due to an unripe condition of the uterine tissue, and nothing has been more clearly demonstrated of late years than that the uterus in which there is dysmenorrhea of any form is not a ripe uterus.

The mechanical obstacle to menstruation is not confined to the uterine orifice, but takes a much wider range. It is found in the endometrial epithelium, in the terminal vessels, in the structure of the uterine walls and in the structural changes incident to inflammation and other morbid processes. It is also dominated by nerve influence. Under normal conditions and at the proper time the endometrial epithelium becomes detachable and is pushed off by the capillary effusion beneath it. There are grounds for believing that the pain of dysmenorrhea in many instances is due to intramural blood-pressure either by reason of the tenacity of the epithelium, undeveloped terminal vessels, or rigid, unyielding walls. The inflow is sometimes obstructed by spasmodic contraction of the vessels or the tissues traversed by the vessels under the influence of perverted nerve energy. Occasionally the trouble is situated at the os internum, not as a mechanical obstruction, *per se*, but in the form of an orificial irritation which may produce spastic or reflex phenomena such as are found in vaginismus. The effect of full dilatation in such cases would be most salutary.

There are different ways in which we may possibly stimulate the uterus and bring about a more vigorous action in it, so that it will right itself. We must remember the idiosyncrasy of individuals. What is food for one is poison for another. While the cases reported by Dr. Carstens seem to have been well selected, and he has had beneficial results, there are many cases on record in which the introduction of the stem pessary by careful and good men has been very pernicious. If we can stimulate the uterine tissue to better action, and thus bring about its development, we will have accomplished a great deal. Frequently it is not so much the mucosa at fault as it is the muscular layer, and sometimes it includes not only the uterus, but the adnexa as well.

My remarks have reference now particularly to dysmenorrhea.

In cases of dysmenorrhea we must look farther back than the os internum. We frequently find it is due to pressure in which the blood cannot pass through the uterine tissues because of their unripe condition. Stasis, for instance, may prevent it. If we can stimulate the uterus and encourage a freer circulation we are likely to get the results we desire. I believe Dr. Carstens's method is beneficial in properly selected cases, but it will take a man like him to select suitable cases for the use of stem pessaries.

DR. CARSTENS (closing the discussion).—Twenty years ago, when we knew very little about antiseptic surgery, it was bad practice to use a stem pessary. At that early period we did not know very much, if anything, about latent pus tubes. These pessaries were used at that time for the purpose of keeping the uterus in position, with the result that there was pelvic inflammation and trouble of all kinds, hence stem pessaries were discarded. I have referred to an entirely different class of cases,—cases of undeveloped uteri accompanying scanty menstruation, or absence of menstruation, with more or less dysmenorrhea. They are cases in which there are no pus tubes. The vagina and uterus, of course, are cleaned before the stem pessary is introduced. Most practitioners have occasionally introduced a pessary to support the uterus temporarily, say for two or three months, and if the parts are thoroughly cleaned, there is no reason why the pessary should give trouble. It does not irritate the uterus; it is kept in place, and the uterus contracts on it.

The whole question revolves around the one point of correct diagnosis. Many of you have had difficult conditions to deal with; for example, women who have taken medicine in great quantities. They have been in the hands of all kinds of practitioners, without benefit. The introduction of the stem pessary in many such cases has afforded great relief. I would advise you to try its use. Patients with these pessaries can walk and sit without inconvenience. I have no fear of the pessary causing trouble, even if patients should go out of town. In case the pessary should give them any trouble when away from home, it is an easy matter for them to consult a physician who can remove it. They can go to New York, to Philadelphia, or anywhere else, and if any trouble should happen, it can be removed by a competent physician in about two minutes.

TUBERCULOSIS OF THE FEMALE GENITALIA AND PERITONEUM.

By JOHN B. MURPHY, M.D.,
CHICAGO.

THE history of tuberculosis of the female genitalia dates back to 1744, when Morgagni, making a necropsy on a young woman who had died from tuberculous peritonitis, found the uterus and both Fallopian tubes filled with caseous material. The tubes and ovaries were firmly adherent, so that it was impossible to separate them, and Morgagni considered the lesions as being the primary focus of the disease. Similar observations were reported by Louis and by Senn of Geneva later on.

In 1831 Reynaud gave a description of two cases of uterine tuberculosis found in tuberculous patients. Lesions of the tubes were figured by Cruveilhier and tuberculosis of the uterus described by Kiwisch and Paulsen. Up to this time genital tuberculosis had been considered merely as a pathologic curiosity and of no clinical interest (Virchow and Rokitansky).

Brouardel, in 1865, in a thesis corrected the early information on the subject and gave a good account of the gross pathology. Koch's discovery of the specific germ of tuberculosis aroused fresh interest in the subject, which was increased by Babes finding the tubercle bacilli in the vaginal secretions, and by the publication, in 1886, of Hegar's exhaustive and classic contribution on the pathogenesis, diagnosis and surgical treatment of the condition. We owe to Cohnheim and Verneuil (1883) the suggestion that coition might be the starting point of the tubercular localization.

During the last fifteen years many contributions to this subject have been published, prominent among them being papers by Stolper, Schöttlander, Wolff and Polano. The pathologic anatomy has been studied especially by Cornil, Monprofit, Franck, Wolff and Schöttlander.

Frequency.—Tuberculosis of the female genitals has received but little attention, if one considers the ubiquity of tubercular dis-

eases in general. Some idea of its frequency can be gained from the following statistics:

Nimias and Christoforis found 1 case in every 12 necropsies on tuberculous women.

Schramm found 1 case in every 34 cases.

Posner found 1 case in every 35 cases.

Mosler found 1 case in every 40 cases.

Kiwisch found 1 case in every 40 cases.

Cornil found 1 case in every 50 to 60 cases.

Merletti, in 6,000 necropsies at Parma, found that tuberculosis was the cause of death in 1,360. In 205 of these the genitals were involved; in males 34 (2.41 per cent.); in females 172 (12.6 per cent.).

Hansemann (cited by Veit), however, in 7,000 necropsies at the Friedrichshain Hospital, Berlin, found 450 cases of tuberculosis in women (6.5 per cent.). In only 16 of these (4 per cent.) were the genitals involved.

Frerichs gives the percentage of primary tuberculosis of the female genitals at 6; Mosler, 19.5; Spaeth, 24.5.

According to Amann, in males 3 per cent. of tubercular lesions involve the genital organs; in females, 20 per cent. According to Still, 9.5 per cent. of tuberculous girls under 12 years of age have genital tuberculosis.

Senn (Geneva), in performing nearly 2,000 laparatomies for various indications, found tuberculosis of the female genital organs 19 or 20 times.

Out of 1,600 pieces of tissues from the gynecologic clinic in Griefswald which were examined for tubercle bacilli, they were found in 24 (Martin).

Etiology and Pathogeny.—Genital tuberculosis may be either primary or secondary. By the former we understand that the focus in the genital apparatus is the only one in the body. In favor of primary genital tuberculosis are the facts that:

(*a*) Otherwise strong, healthy people have primary manifestations in the genitalia;

(*b*) After the removal of the local genital focus, patients remain well for years;

(*c*) Children otherwise apparently healthy, have primary tuberculosis manifested only in the external genitalia.

The primary form is less frequent than the secondary. Some authors (Scanzoni, Klebs) absolutely deny the possibility of this

form; others (Lebert) consider it to be very rare. On the other hand, Schramm, in his 34 cases of genital tuberculosis, found 1 primary. Spaeth, in 119 cases, found 27 primary (24.5 per cent.), Mosler, in 46 cases, found 9 primary (19.5 per cent.), while in 15 cases noted by Frerichs, 1 was primary.

The secondary form is frequent in phthisis. Thus, Turner met it in 5 out of 27 necropsies on cases of chronic phthisis at the Brompton Hospital. In 7 more there was catarrhal salpingitis, the tubes looked suspicious, but no naked-eye appearances of tuberculosis were found. Stolper, in 34 necropsies on women dying from pulmonary tuberculosis, found tubercular lesions of the genitalia in 7 (80.5 per cent.).

We owe to Hegar the theory of two forms of genital tuberculosis in the female—an ascending, which is generally primary, and a descending, which is generally secondary. For the production of the primary, the two following possibilities must be taken into account, according to Hegar: (1) penetration of germs from the outside directly to the mucosa of the vagina, uterus, tubes and finally the peritoneum and ovary; (2) penetration of germs through minute breaches of continuity in the genital canal, into the lymphatics, thence to the Fallopian tubes directly, or against the lymph current as we see it in the neck occasionally, or by way of the pelvic peritoneum into the tubes at the fimbria.

Amann remarks that in addition, the cryptogenous forms (those in which the genitalia are the only localizations of long latent tuberculosis, or in which the bacilli, penetrating the blood-stream or lymph-current, cause lesions of the genital tract alone), may be considered primary.

The sources of bacilli in the production of genital tuberculosis in general may be classified as hematogenous, lymphatic, contiguity of tissue and continuity of surface.

Bouilly, in a communication to Amann, gives as his opinion that infection is most often of hematogenous origin; he himself does not know of any case of direct contagion.

According to Kleinhans, there are three arguments in favor of infection by means of the blood current:

(1) The existence of tuberculosis in the genitals following tuberculosis of the lungs, with no intermediate foci;

(2) The frequent localization of tuberculosis on the site of the placental attachment;

(3) The transmissibility of the bacilli from the mother to the fetus.

To these Veit adds the sudden eruption of acute general miliary tuberculosis, which has been many times noticed to succeed the existence of a markedly circumscribed focus.

Voigt, however, calls attention to a fact which in his opinion negatives transmission by the blood current, namely, the frequent occurrence of genital tuberculosis during the period of sexual activity. Hence, he is of the opinion that there is more reason to suspect direct ascending infection. (In my experience it is quite as common before puberty, but less frequently recognized.)

Direct infection may occur from dirty instruments, bed linen and clothing, the accoucheur's or patient's fingers, and especially from coitus.

In 1882 Cohnheim asked if the semen of tuberculous individuals with absolutely healthy genitals may not contain the tubercle bacilli. A little later Verneuil declared that a tuberculous male with sound genitals is capable of transmitting tuberculosis by coitus. It is a question how he knew they were healthy, as it is very difficult to determine tuberculosis of the seminal vesicle. Verchere reported two cases of this kind, and Fernet made a systematic examination of the tuberculous patients who were under his care during a year's service. He communicated the results to the Hospital's Medical Society of Paris and confined his remarks to cases where the genital tuberculosis was evidently or probably primary. With these limitations, he found two in which it was evidently due to coitus with tuberculous men. Derville mentions three males who died of phthisis, without involvement of the genitals, yet tubercle bacilli were found in the semen. An analogous case is narrated by Foa.

In support of the direct transmission by coitus, I shall cite the following case which came under my observation: Mrs. L., aged 32, whose husband had been treated by me for three years for tuberculosis; first tubercular empyema, second, tubercular osteitis of the spine, and for eleven months preceding the appearance in Mrs. L., he had suffered with tubercular epididymitis, with tubercle bacilli in the semen and urine. Mrs. L.'s illness dates from four months previous, when she had her initial attack of pelvic peritonitis. She had recurrent attacks of this inflammation every three to six weeks, accompanied by severe pain, elevation of temperature, and great sensitiveness in the pelvic peritoneum. The tubes were enlarged, and there was some fluid in the pelvic peritoneum. The uterus was not fixed; the fornices were not infiltrated, but there was a stiffness of the peritoneal folds. Diag-

nosis, tuberculous peritonitis and tuberculosis of the tubes, with no evidence of tuberculosis in any other portion of the body. Operation; section revealed enlarged tubercular tubes, both fimbriated ends patulous, with pronounced ectropion of the mucosa; hard, caseous masses in each tube about three-quarters of an inch from the cornu of the uterus; these masses appeared to be the primary foci in the tubes. The cul-de-sac had confluent tubercular eruptions; as the distance from the fimbriated end increased, the number of tubercles on the peritoneum diminished. The peritoneum and intestines were free from tubercles above the promontory. The tubes were removed and the abdomen closed; complete recovery and patient has remained well for the last nine years.

While this would appear as a direct transmission with only a genital and peritoneal involvement, I have seen so many cases of tuberculosis of the epididymis with tubercle bacilli in the urine and seminal discharge in married men without the wife becoming infected, that I must conclude that other conditions are necessary for the development of the tuberculosis in the female genital tract.

In some cases, notably that of D'Aubeau, the discovery of bacilli in the semen without any lesion of the genitals, was the first evidence of unsuspected pulmonary tuberculosis. Curt Jani was unable to find bacilli in the seminal fluid of tuberculous patients. Pursuing his investigations further, however, he found them in apparently healthy testes and prostates (6 out of 8 testes and 4 out of 6 prostates). This probably accounts for many of the erroneous diagnoses of tuberculosis of the bladder and testicles made on the basis of bacilli found in the urine.

Amann refers to Mammer's case as one of the most striking examples of this mode of infection. A woman of 35 died from general miliary tuberculosis four years after marriage; at the necropsy the only tubercular focus was a caseous Fallopian tube; the uterus and vagina were not involved. The husband, who came from a tuberculous family, had both apices involved, although there was no trace of disease in the genitalia; he was accustomed to lubricate the parts with saliva to facilitate intromission.

Pfannenstiel and Merletti each report one case and Prochownik two of genital tuberculosis where the husbands had tuberculosis of the testicle. In Kehrer's case, the patient died from a postpartum genital tuberculosis, and her husband died soon after from genital tuberculosis also.

Similar cases, in which the husband was tuberculous and the wife healthy, are described by Keppler, Strassman, Hofmeier, Rein, von Franque, Menge, Pincus and 7 by Jacobs (Amann).

Experiments on animals have been undertaken by a number of observers, *e.g.,* Landouzy and Martin took semen from a tuberculous patient whose testicles were apparently healthy (they do not state the condition of the seminal vesicles), and after diluting it with a one-half-per-cent. solution of sodium chloride, injected it into the peritoneal cavity of 15 guinea pigs. Five of the animals died from tuberculosis. Similar results were obtained by Sirena and Pernice and by Solles.

Maffucci, after injecting large doses of tubercular cultures into the saphenous vein of animals, found tubercle bacilli in the testes and their secretion. Jaeckh introduced fragments of testes from tuberculous patients into guinea pigs and rabbits, and, killing them in two to three months, found three out of five guinea pigs tuberculous; the rabbits were not affected.

Gaertner made a series of experiments to see if bacilli would be transmitted from the parent to the fetus. After inoculating the testes of rabbits and guinea pigs with tubercular material, he found that a number of females fecundated by these males became tuberculous, with marked lesions of the uterus and vagina. In 65 female guinea pigs, 5 died from tuberculosis starting in the vagina; tubercles were found in the lungs, liver and spleen; the vagina was filled with yellow, caseous masses swarming with bacilli. Lymphatics infiltrated with tubercles were rare towards the peritoneum; of 59 rabbits, but 9 presented the same appearances.

Spano examined the semen of seven individuals dying from tuberculosis (six in the lungs, one in the hip), microscopically as well as by cultures and inoculations. Negative results. In another series of 6, the results were positive. In 2 of these, bacilli were not found in the semen on microscopic examination, and inoculations into the peritoneum and in the vagina, after irrigation, were successful in 2 out of 3 animals.

Peraire injected pure cultures from the secretions of tubercular endometritis into the vaginæ of rabbits and observed tubercular metritis and endometritis as a consequence. Cornil and Dobroklonsky also injected tubercular culture into the vaginæ of guinea pigs, taking great care not to wound the mucosa. The animals were killed after intervals of from four to thirty-two days, and

in those killed after fifteen days tubercles were found in the uterus.

Oncarini, however, obtained negative results. This observer first produced lesions of the vagina in guinea pigs by injecting tincture of iodine; then he introduced pieces of tissue from tubercular salpingitis. General tuberculosis was produced in all the animals, but in none were genital lesions discovered. A pregnant female gave birth to a young one, which died in three weeks from tuberculosis of lung, spleen and liver.

Popoff, in a series of experiments on guinea pigs, divided the animals into three series. In the first series of eight, tubercle bacilli were simply deposited in the vagina without any traumatism; negative results. In the second series of four, the vaginal mucosa was wounded with a needle until hemorrhage ensued, and thirty minutes later cultures of tubercle bacilli were injected. Tubercular lesions ultimately developed at the points wounded. In the third series of four, trauma was produced by the injection of irritants (iodin, turpentine, etc.), and cultures injected 48 hours later. Tubercular lesions developed in the inguinal and retroperitoneal glands and the genital apparatus, but nowhere else. As a result of his experiments, this author concludes: (1) It is impossible to infect the genital organs unless there is some preceding trauma. (2) In cases of tuberculosis following traumatism, the lesions remain localized in the genital apparatus and its lymph glands.

Marie Gorovitz reaches similar conclusions from her experiments on 11 rabbits and 15 guinea pigs, using pure cultures of tubercle bacilli diluted with sterile boiled water. She concludes: (1) Simple deposit of the bacilli in the vagina without trauma will not give rise to tuberculosis. (2) Deposit of bacilli in the uterine cornua of the guinea pig produces tuberculosis which may be propagated to the vagina or first reach the iliac or lumbar glands, especially at the bifurcation of the lumbar aorta, which are nearly always caseous. (3) In some cases, the bacilli seem to pass through the uterine cornua without causing any macroscopic lesion and directly invade the lumbar glands. (4) Tubercular peritonitis may be observed secondary to tuberculosis of the uterine cornua, and seems consecutive to subperitoneal lesions of this organ. (5) In rabbits, inoculations made with the same technic as in guinea pigs were unsuccessful.

Gaertner considers infection by coitus rare, for he claims that if it were frequent the glans penis and urethra would often be

found tubercular, while in actual practice this is exceptionally the case.

Another argument against this as the only mode of infection, according to some authors, is furnished by cases occurring with colpatresia.

For example, H. Thompson reports the case of a girl of 15 with atresia. The vagina was distended by a turbid liquid, there were miliary granulations on the cervix and caseous nodules on the pelvic peritoneum, besides tuberculous bronchial glands.

Gersung extirpated the uterus, adnexa and part of the vagina in a woman of 19 witn congenital colpatresia. The vagina and distended uterus contained over three litres of greyish-yellow liquid. The mucosa of the tubes, uterus, and especially the vagina, was caseous and contained giant-cells. The tubes, though short and presenting nodular thickenings, were permeable at the orifices.

Most authors deny the congenital infection of Baumgarten, except in very young children.

Fers reports a case which seems to prove the transmission of tuberculosis to the fetus. Schmorl and Kochel have more than once discovered tubercle bacilli in the placenta, and in a child 30 hours old, whose mother died of tuberculosis, Bugge found bacilli both in the umbilical and hepatic vessels.

Any disease which causes abnormal secretions, as gonorrhea, for example, lessens or destroys, or, better, they produce the necessary abrasion for inhibiting the bactericidal action of the vaginal mucus. The frequency of post-partum tuberculosis shows that the puerperal state, with its attendant traumatism, is a common source of primary infection. Thus, in 16 cases of miliary tuberculosis which appeared during the puerperium, cited by Merletti, in five caseous foci were found at the ends of the tubes. In Orthmann's 23 necropsies on genital tuberculosis, eight were of the miliary variety (Duhrssen's) and several of these had commenced during the puerperium.

Even operative intervention may give rise to the disease, as in Duhrssen's case (cited by Amann), where catheterism of the uterus to overcome sterility, led to acute tuberculosis of the tube and peritoneum. Attention may also be directed to Carbonelli's case, where general tuberculosis ensued fifty days after an operation for tubercular ovarian cyst.

Extension from the intestine is looked on by Naegeli as exceptionally rare, since the mesenteric glands are so rarely involved.

Amann, Hegar and Von Rosthorn have also noted the absence or but slight involvement of the retroperitoneal glands. Amann, however, calls attention to three cases met with by Duhrssen. In three patients, adhesions between tubercular loops of bowel and the Fallopian tubes led to secondary tuberculosis of the latter. As all three patients drank much raw milk, Duhrssen investigated the source of the milk and found the cow tuberculous. In this connection, Strassman's cases of genital tuberculosis in a butcher's wife and in a girl looking after the cows on a farm are of interest.

(We have observed, in two cases, the adherent fimbriated end of the tubercular tube communicating with the intestinal tract, with tubercular ulcer of the intestine at the point of union. This we interpreted as a primary tuberculosis of the tube with secondary ulceration of the wall of the intestine and tubercular infection at that point. Again, in not a small number of cases circumscribed tubercular abscesses communicate with the tube and with the intestine. In all of these cases also, we have attributed the primary lesion to the tube, as in all of them the other tube was involved, and in two the fimbriated end of the other tube was open and no mixed infection, though the tube was tuberculous.)

While genital tuberculosis is common after the menopause, Kaufmann directs attention to senile involution of the cervical tissue in old women as favoring the production of the condition. In a necropsy on a woman of 77 years, presenting no traces of tuberculosis elsewhere, an ulcerated cervical lesion was found which had the gross appearance of carcinoma, but proved, on microscopic examination, to be tuberculosis.

The order of frequency with which the organs are involved is: Tubes; uterus; ovaries; vagina and vulva. A single segment may be involved (although this is rare); on the other hand, cases are reported where the whole genitalia were attacked; *e. g.*, those of Geil, Gusserow, Kretz, Frerichs, Davidsohn and five by Voigt.

Diagnosis.—Martin emphasizes the fact that ***up to the present time we know of no pathognomonic clinical symptom of genital tuberculosis, and especially of its chronic form.***

Hence the anatomic diagnosis can be established with certainty only by the discovery of the specific bacillus of tuberculosis. The search for this must be undertaken in every case where there is reason to suspect its presence. As in other forms of local tuberculosis, and especially in chronic cases, the bacilli may be very few in number (only one in forty-seven slides). However, a sys-

tematic examination of scrapings and discharges for the bacillus will reveal its presence in a surprisingly large number of cases, as mentioned above. The search for the bacilli being so difficult, some authorities are content with the discovery of typical tubercles. The great similarity of the smegma bacillus to that of tuberculosis must not be lost sight of.

For finding the tubercle bacillus, Alterthum prefers the Kuhne-Bordel method. This consists of coloration of the nucleus with hematoxylin and hematin, washing in water, then coloration in Ziehl's phenic-fuchsin for fifteen or twenty minutes. Differentiate by passing through a 2-per-cent. solution of hydrochlorate of anilin for a few seconds, decolorize cautiously with alcohol, lastly xylol, etc.

Babes, in 1883, was the first to discover the bacilli in vaginal secretions, and they may be sought for either by the microscope or by the culture method. Veit recommends inoculation in animals in addition, especially guinea-pigs, which he considers preferable to simple examination. Inoculation may be made from vaginal secretions or from aspirated peritoneal fluid. This inoculation is one of the most reliable tests for tuberculosis and is neither difficult nor slow in giving results and should be resorted to in every case.

Bimanual examination is not very conclusive, though Hegar and his school insist on the diagnostic value of the nodes found on or in the utero-sacral ligament. (For the conflicting views as to the nature of the nodes on the free ends of the tubes, "salpingitis isthmica nodosa," see section on tubal tuberculosis.) According to Veit, adhesions due to tuberculosis are, as a rule, rather easily distinguished from those of gonorrheal origin, being much more extensive.

In doubtful cases, the general systemic examination becomes of great importance, especially a detailed study of the clinical history. In Senn's experience, the use of the thermometer has been of great diagnostic value in tubal tuberculosis. He states that "a constant slight rise in the evening temperature, and a normal or slightly subnormal morning temperature, are very suggestive of the tubercular nature of the tubal affection."

Veit, who regards genital tuberculosis as generally secondary, believes the principal object of the clinical diagnosis is to determine whether the infection is limited to the genitalia, or affects other organs also.

Martin directs attention to the frequent coincidence found of

late between tubal pregnancy and tubal tuberculosis, which he considers of great interest from a diagnostic standpoint. He believes we are justified in supposing the former to be a consequence of the tuberculosis and when confronted with tubal pregnancy we must bear tuberculosis in mind.

Symptoms.—These are neither numerous nor characteristic. In Martin's cases, sterility was the most prominent symptom. Only one of his twenty-four patients with genital tuberculosis became pregnant during the course of the disease, and twelve others had few or no children. The contrast, he states, is the more striking since many had gone through a series of pregnancies.

Menstrual disturbances are slight, especially at the onset. Later on, after the inner surface of the uterus has become caseous, there may be amenorrhea. In other cases there may be menorrhagia.

Menorrhagia in young girls should always arouse the suspicion of tuberculosis, and careful and repeated microscopic and inoculation tests should be made, both during the period and in the interim. The presence of menorrhagia has been valuable in many cases in leading to the diagnosis of tuberculosis of the genital tract.

Vassmer, in six cases of uterine tuberculosis, observed no discharge. In some cases, however, there is an abundant mucopurulent discharge, with passage of caseous masses. Even then, there is nothing characteristic about the discharge, unless bacilli are present.

Pain is not complained of by most patients, except occasionally in tubercular salpingitis.

Prognosis.—While the prognosis in tuberculosis of the genitalia and peritoneum is always very serious, the disease is not at all as fatal when properly treated surgically, as we have been led to believe. In the first place, spontaneous cure is possible, though undoubtedly uncommon; again, a localized focus is favorable for extirpation, as proved first by Hegar and by numerous operators since. The prognosis will depend on whether there are tubercular lesions elsewhere and their extent. If the disease in the genitalia is secondary to lesions elsewhere, the genital complication does not seem to add to the gravity of the original disease. In cases occurring in the puerperal state, death may ensue with extraordinary rapidity. Other things being equal, the results of surgical treatment are very satisfactory. So much for the general consideration. We will now analyze the individual types of the disease as it manifests itself in different portions of the genitalia and peritoneum.

SECTION I. TUBERCULOSIS OF THE VULVA.

This is the most infrequent variety of genital tuberculosis, in fact it is so rare that Spaeth was unable to find a single case of primary tuberculosis recorded, up to 1885. This infrequency of the disease in a region easily accessible to external infection is looked upon by some writers as an argument in favor of the descending, or secondary route. It is, however, more probable that the bacilli pass over the external genitals and find a more appropriate soil in the internal organs—uterus, ovary, and especially the tubes. While rare, there are several well-authenticated cases of vulvar tuberculosis.

Cayla reported a case of extensive ulcers of the labia and vaginal orifice. The numerous nodules, on microsopic examination, showed the characteristic structure of tubercles. The lungs were involved also.

Deschamp's patient also had advanced pulmonary lesions. She was 25 years of age and some months before had sustained an injury to the vulva by a fall; shortly after leucorrhea and intolerable pruritus appeared. There was deep ulceration of the left labium minus and the fourchette. Pieces of tissue showed the typical appearances of tubercle and on being inoculated in guinea-pigs the results were positive. Death occurred in seven months from the time of the injury and tuberculosis of the lungs and external genitalia were found at the necropsy.

Chiari reported a case in a woman of 30. There was pulmonary tuberculosis as well as extensive tubercular ulcers in the rectum. Necropsy showed the internal genital organs were not involved. A large ulcer of the vulva was present, which had involved the vagina also.

Deuse reports three cases of primary tuberculosis in children: I. Child 13 months old; ulcer situated on inner aspect of left labium minus. The secretions from this contained numerous tubercle bacilli. Death at 16 months from tubular meningitis. In addition to the ulcer of the vulva, a more recent one was found in the vagina also containing bacilli. II. Child of 7 months with tuberculous father; ulcer situated at orifice of vagina. III. Child of 15 months with good family history. A mucopurulent discharge appeared after an attack of measles; ulcer at orifice of vagina; tissue proved tuberculous by microsopic examination. Died from tuberculous pneumonia; tubercle bacilli were found in one of the iliac glands.

In Zweigbaum's case the vulva was attacked by an ulcer of the vagina extending to the former. Death occurred from pulmonary tuberculosis and the uterus and appendages were not involved.

Viattel reports the case of a woman of 36 who had had a yellowish discharge from the vagina for seven years. For three years she had noticed little growths on the vulva which frequently fell off and reappeared. These growths were found to cover an ulcer bordering the vagina, with a firm base and covered with a yellow crust in places. The growths contained no bacilli, but many were found in scrapings from the ulcer.

Montgomery's case was a negress of 30. Family history and childhood negative; four children, one miscarriage. Burning on urination, extending back for years. Labia enlarged, ulcer on inner aspect with indurated borders; induration extended over anterior wall of vagina and about the urethra. Microscopic examination of a fragment excised showed characteristic tubercle formation.

Schenk reported a case in a little girl of 4½ years. There was an ulcer of the vaginal orifice, which had involved the left labium minus, the clitoris and the urethra; the inguinal glands were enlarged. The child had two tuberculous playmates and Schenk thinks infection probably occurred through the fingers.

Davidsohn's case concerned a woman who had an excessively hard labor. Two days later, acute miliary tuberculosis appeared and proved fatal in three weeks. At the necropsy, the entire vagina, as well as the labia minora, was strewn with recently formed miliary tubercles. The cervix and urinary passages were not involved. The diagnosis was confirmed by both histologic and bacteriologic proof.

In Karajan's case, a little girl of two years, with good family history and no signs of visceral tuberculosis, developed pruritus of the vulva with a coincident ulcerative keratitis. Shortly after, a progressive vulvar ulceration occurred; the skin was red, excoriated and covered with crusts. On separating the labia, a tumor was seen, corresponding to the clitoris, firm, the surface covered with small ulcers the size of a pin-head, and with a thick, eczematous crust over all. Elephantiasis of the clitoris was diagnosed and the tumor exirpated. Ten months later, a new vulvar ulcer appeared, with enlarged inguinal glands. Another tumor had appeared in the scar of the operation; this was again extirpated. The excised tumors were composed of connective tissue

covered by normal skin, with tubercles irregularly distributed below the derma. Bacilli were found, though few in number. Scleroderma, with small ulcerations here and there, of the external genitalia, should arouse the suspicion of tuberculosis and a most careful search should be made for its characteristic pathologic changes.

Reick reports a case in a woman with good family history, but whose husband died of pulmonary tuberculosis. There was an ulcer of the vulva with hypertrophy of the labium minus. Excision; tissue showed tuberculous lesions.

In Kelly's case, a patient of 55 complained chiefly of the stinging pain caused by the urine flowing over the ulcerated vulva. The disease involved the vestibule and the central portion was eaten out; the deeper tissues, while infiltrated were not especially indurated. A few bacilli were demonstrable. On histologic examination, the surface was found to be made up of the characteristic granulations, with scattered tubercles through the deeper tissues, some located immediately below the urethral mucosa.

Kuttner reports the case of a little girl of 6 with bronchial catarrh. The sputum contained tubercle bacilli. There was induration of the right labium majus, with an ulcer in the upper two-thirds; there were also some small ulcers over the mons veneris and the upper part of the left labium majus. Excision, suture, cure. Examination of the excised tissue and the tributary lymph glands showed the characteristic tubercular lesions.

So it will be seen there are numerous cases of tuberculosis of the vulva on record and they would be materially increased if cases described as esthiomene, lupus, rodent ulcer, etc., were included, as they should be. Esthiomene was first described by Huguier, of Paris, who reported nine cases in 1848. The French school looked on it as a scrofulous manifestation. The English surgeons of the same period regarded it as a "noli me tangere" belonging to the epitheliomata. For instance, Paget, after examining some tissue said: "When a specimen for examination microsopically was taken from the substance of the base immediately beneath its surface, I found nothing but the natural tissues of the mucous membrane (rete malpighii) with infiltration or inflammation with reparative material. If taken from the surface, on examination of the ulcer during life, they would have led to epithelial cancer."

Pathologic Changes.—Since the structure of the vaginal mucosa is practically the same as that of the surrounding skin, the pathologic changes resemble those in tuberculosis of the skin itself.

We have a diffuse chronic inflammation with perivascular infiltration of small round-cells. Epithelioid and giant cells are found on section. The specific bacilli are also found, but few in number, and can sometimes be discovered only after examining a number of sections. In the older parts of the lesion, the bacilli may be entirely wanting. In the appearance of the ulcer, it often resembles a carcinoma or epithelioma of the labium. In the former there are frequently small healed areas, while the latter never has healed areas.

Clinical Course.—The onset is in the form of a dull red or livid discoloration of the skin, which is indurated and slowly increases in size. After a variable length of time, these tumor-like masses soften and break down, forming ulcers. These ulcers vary considerably in size, are round, oval or irregular in shape. The edges are infiltrated at first, later on ragged and undermined. The base is uneven, granular and covered with a yellow crust. Miliary tubercles are often seen about the borders. The ulcers do not bleed readily and show no tendency to heal, but advance slowly or heal behind as they advance. After a time, from coalescence, an extensive destruction of tissue may take place, with fistula formation and destruction of the perineal body. In other cases, there is great proliferation of tissue, with formation of nodules and polypi. If the disease involves the clitoris, this may be so enlarged as to be mistaken for elephantiasis. The inguinal lymph glands are not involved for a long period.

Pain is not noticeable and the first symptom noticed, as in Kelly's case, may be pain on urination after a well-defined ulcer is present. In many cases, the disease is of such slow growth that it remains unnoticed for years.

Diagnosis.—The only diseases likely to prove difficult of differentiation are syphilis, phagedena and carcinoma. In some cases the distinction is very embarrassing, even after a careful anamnesis. As before stated, the inguinal glands are not often involved in tuberculosis; this and the multiplicity of the ulcers and the negative results of specific treatment will distinguish it from syphilis. From carcinoma, it can, as a rule, be told by the exceedingly slow progress of the disease. In many cases, resort must be had to microscopic examination of pieces of excised tissue, search for the bacilli and animal inoculation with the secretions.

Treatment.—The only treatment of any avail is radical extirpation. Escharotics, such as iodin, the thermo-cautery, cauterization with chromic acid crystals or zinc chlorid solution 40 per cent. to

50 per cent., may be used in mild cases, but the disease almost inevitably returns. The tuberculous tissue must be completely excised and the parts sutured. In case of extensive loss of tissue, plastic operation may be called for after the excision. The X-ray should avail here as in superficial carcinomata, but experiences to date are very limited and results problematic.

SECTION II. TUBERCULOSIS OF THE VAGINA.

As regards frequency, this form is usually found in association with similar lesions in the upper portion of the genital tract; it has, however, been discovered in several instances to be the only site of tuberculosis in the genitalia. There seems to be but one case of primary tuberculosis of the vagina known, that of Bierfreund, in which a tubercular ulcer of the vagina was the sole focus in the entire body.

According to Amann, it may arise in the following ways:

(*a*) The infection comes directly from the uterus, vulva, rectum, bladder or by recto- or vesico-vaginal fistulæ, or through Douglas's pouch from the peritoneum. (Babes in 1883, reported a tubercular ulcer in the rectum which perforated the recto-vaginal septum, giving rise to secondary tuberculosis in the vagina.)

(*b*) From contact of uterine and tubal discharge containing tubercle bacilli, or from an infection by the feces (and urine—Virchow), after fistula formation.

(*c*) Directly through the blood-current.

(*d*) Direct infection from without.

H. Thompson, many years ago, reported the case of a girl of fifteen, who, after being in apparent good health, died suddenly after an illness of about seven days. Miliary tubercular lesions were found in the lungs, diaphragm, liver, spleen, kidneys, and meninges. The hymen was imperforate and the vagina was dilated into a pouch eight inches in circumference, containing 25 or 30 fluid ounces of "dark, grumous, offensive material." The fundus and cervix uteri were covered with tubercular granulations. The vaginal mucosa was very vascular and also infiltrated with tuberculous granulations.

Breisky mentions the case of an aged woman who had tuberculosis of the vagina and was operated on for an ovarian cyst. Microscopic examination of the latter showed tuberculosis of the cyst walls.

In Zweigbaum's case, there was tuberculosis of the vagina in

addition to the vulva and portio vaginalis. On the posterior wall of the vagina was an ulcer with hard, raised borders. This was covered with thick, grayish-yellow mucus; a similar ulcer was found on the cervix. The uterus was enlarged and tender, the inguinal lymph glands swollen and hard but not painful. The lesions, later on, involved the left labium minus and destroyed it entirely. The tubercular nature of the process was confirmed by microscopic examination.

An interesting case was met with by Weigert in the cadaver of a woman of 67. In addition to a tubercular ulcer of the ileum and peritoneum, the vagina presented tubercular lesions in all stages, from miliary granulations to caseous degeneration of ulcerations; yet the uterine mucosa was completely intact.

Sippel reports the case of a virgin of 20, in good health but with hereditary history; extirpation of a caseous tube and tuberculous ovary; tubercles were found on the adjacent peritoneum. Later on, tuberculosis appeared on the other side on the uterine mucosa; partial extirpation of the adnexa on this side and treatment of the endometritis resulted in a cure of two and a half years' standing when reported. This author believes there was infection of the vagina, then of the uterus and next of the tubes. He sees in menstruation, during which the superficial epithelium is eliminated and the resistance of the vagina increased, a protection against uterine invasion.

Jorfida narrates the case of a woman with no family history, and whose husband was healthy, who, soon after delivery, presented a tubercular ulcer of the vagina with consequent glandular infection and no signs of the disease elsewhere. In this case the probable source of infection was a woman dying of the pulmonary form whom the patient visited. Bacilli were found in the vaginal secretions and in the ulcer, and probably gained entrance through the lacerations incident to delivery. A cure resulted after curetting and the use of the cautery.

Springer, who reports a series of twelve cases of secondary vaginal tuberculosis, found but two evidently due to blood infection; in the rest it was due either to extension by contiguity, or to contamination by secretions or tubercular masses proceeding from the uterus and tubes.

Pathogeny.—The miliary variety seems to be less frequent than the ulcerative, though miliary tubercles are nearly always found in the vicinity of the ulcers. The latter are either shallow or deep, with a flat floor, covered with a grayish crust. Here as elsewhere

the ulcers frequently become confluent, with consequent increase in the loss of tissue. As before stated, in Babes's case a tubercular rectal ulcer penetrated into the vagina. On the other hand, the process may extend in the opposite direction from the vagina into the bladder or rectum, and give rise to fistula and secondary foci in these organs.

Symptoms and Diagnosis.—The symptoms present nothing pathognomonic and the diagnosis, owing to the accessibility of the lesions, is attended with less difficulty than when deep seated. Here again it is to be differentiated from syphilis and malignant disease, and here, also, we must rely on the aid afforded by specific treatment and by microscopic examination of excised tissue and staining and inoculation of secretion. In this variety, the discharge seems to appear early and it is frequently yellowish. The ulcers are both insensitive and bleed with difficulty.

Treatment.—In the milder cases, the application of chemical agents as chromic acid or curettement may suffice. In the severe ones, more vigorous measures are necessary, even partial or complete removal of the uerus, with vaginal wall when the ulcers are numerous about the posterior fornix, as they sometimes are.

SECTIONS III. AND IV. TUBERCULOSIS OF THE PORTIO VAGINALIS AND CERVICAL CANAL.

Frequency.—This form is very rare and seldom combined with tuberculosis of the fundus. Thus Spaeth, in 119 cases of uterine tuberculosis, found the cervix affected in only 6. Vasmer, in 6 cases of tubercular endometritis, reports the cervix free from changes. Stolper reports nine cases of genital tuberculosis in one of which the cervix was involved. In 87 necropsies on tuberculous women by Doran, there was involvement of the genitalia in 5, but of the cervix in one only. Geil records two cases in which the fundus, tubes and vagina were tuberculous, yet the cervix remained free. Michaelis, in reporting three cases of cervical tuberculosis, states that he regarded one as a primary tuberculosis since the uterus itself exhibited no changes. The other two were associated with tuberculosis of the upper genitals and lungs. This case, it seems, is not the only one of primary cervical tuberculosis. Others have been reported by Friedländer, Emanuel, Kauffman and Spaeth.

Cornil studied a uterus removed by hysterectomy for supposed cancer. The cervix was hypertrophied and transformed into an indurated mass with irregular vegetations. In spite of

the advanced state of the lesions, nothing could be told from the histologic examination and the inoculations alone were conclusive.

In Emanuel's case, a woman of 50 had a tumor of the cervix the size of an apple, with invasion of the vagina. Microscopic examination showed tuberculosis; hysterectomy; death. Necropsy showed the lungs healthy; there was miliary tuberculosis of the liver, spleen and peritoneum. The cavity of the uterus was entirely filled with caseous masses. Since the tubes were absolutely unaffected, Emanuel believes this proves the disease to be primary in the cervix. What confirms it, in his opinion, is the considerable increase in size of the cervix and the invasion of the vagina. In cases of secondary invasion of the cervix there is no such increase in size.

Williams narrates two cases of ulcer of the portio vaginalis, which on necropsy examination showed tubercular nodules and bacilli. The lesion was clearly limited to the vaginal portion of the cervix and the neighboring part of the vaginal mucosa; the rest of the genitalia were absolutely normal. In both patients there was extreme pulmonary disease.

Walther reports the case of a woman of 26; no family history. After a normal accouchement, noticed a profuse bloody-mucus discharge, with erosion about the cervix, bleeding easily. Curettement; cure. The interesting point in this case is the histologic examination of fragments of mucosa. In that from the cervix, it was possible to find islets of pavement epithelium, a typical ulceration deprived of epithelium and strewn with miliary tubercles and in places granular cells with caseous masses. One might, says the author, suppose the tubercular process to be limited to the cervix, but examination of the mucosa from the fundus showed, besides marked granular hyperplasia, giant and epithelioid cells in the interstitial tissue, but without any characteristic tubercles.

Matthews records the case of a negress of 38 with dysmenorrhea for three years; mucopurulent discharge and hypogastric pain. The cervix was twice the normal size, ulcerated and bled easily, with propagation of the ulcer to the vagina. Hysterectomy per vaginam, with partial ablation of the vagina. Examination after removal showed diffuse infiltration of the cervical cavity (tubercles, caseous degeneration) miliary tubercles of the muscularis. Mucosa of the fundus and the tubes negative.

Driessen's case concerned a woman who had been operated on

seven years before for stricture of the rectum, and had been complaining for some time of menorrhagia and a mucopurulent discharge. The cervix was found hypertrophied and studded with many small ulcers, most numerous about the os, and growing fewer towards the periphery. In the cul-de-sac were little red spots with small yellowish centers. Vaginal hysterectomy. Examination of organ after removal showed characteristic change of tuberculosis. Here and there the epithelium of the cervical glands projected into the interior of the glands, forming papillary excrescences. In certain locations, little cavities filled with polynuclear leucocytes were found between the epithelial cells. These may be considered as small abscesses or as a commencing necrobiosis and are very characteristic of a tubercular affection.

Vitrac gives details of a woman with tubercular history; the cervix was enlarged posteriorly with hard irregular masses; the uterus itself was small. Consolidation of left apex. Hysterectomy; examination showed the masses collected in the cervical lip. Follicles more or less mixed up between the base of the glands inside, and the cervico-vaginal mucosa outside. Some were separated from one another by the organs about which they are developed—acini, vessels, etc. Bacilli were found and inoculation experiments in guinea-pigs were positive.

In Frank's patient, the disease was mistaken for sarcoma. Some five or six years previous, she had tuberculosis of the metacarpal bone and one phalanx of the middle finger, which were excised, and a cure resulted. The portio vaginalis was much modified and resembled a grayish-yellow mushroom. The tissue about the os was proliferated and covered with vesicles and nodes. This proliferating mass bled easily, and everything seemed to indicate a cancerous growth. A piece being excised for examination, violent hemorrhage ensued, so free as to require gauze tampons. The uterus was extirpated, the tubes being apparently healthy; recovery; the secretions examined three mouths later showed no bacilli. Frank believes the infection in this case was communicated by the hand or by soiled linen. He thinks the idea of infection by metastasis or through the lymphatics must be abandoned, for the peritoneum was normal and contained no fluid. A curious feature was that the patient had never suffered any pain, and sought relief for amenorrhea.

Beyea's case was a young woman of 23, with no tubercular history, but having irregular menstruation and leucorrhea for three years. The portio vaginalis was hypertrophied to twice its normal

size, and was eroded for some little distance (nearly an inch in places) from the os; this eroded area was bright red and bled easily. Pieces exhibited showed miliary tuberculosis and giant cells. Curettement, high amputation of cervix and bilateral salpingo-oophorectomy; patient in good condition sixteen months later. Microscopic examination—the flat epithelia of the portio vaginalis showed inflammatory changes beginning by proliferation half an inch from the os externum and progressing in some places to complete destruction; at first the cells preserved their outline, then coalesced into a homogeneous mass, which gradually disappeared. An extensive infiltration of small round cells in company with leucocytes was quite general under the squamous epithelial layer, and in places even penetrated the latter. The papillomata growing from the cervical canal were slender, close together, covered with columnar and cubical epithelium. The stroma also was infiltrated with small round cells, leucocytes and an occasional miliary tubercle, frequently inclosing giant cells. The underlying endometrium and a considerable portion of the new tissue showed the same changes. Bacilli were discovered only after examining several slides.

Lewers met with what he considered primary tuberculosis of the cervix, which simulated cancer and was treated by hysterectomy, with recovery. The patient was a multipara of 36 and for nine months had a fetid and sometimes bloody discharge, in which shreds of membrane could be distinguished; there was a vague pain in the lower abdomen. An aunt had died of tuberculosis, but this was the only case of the disease in the family. On inspection, the os was found enlarged, and occupied by a soft, friable tumor, which bled easily on being touched. The uterus itself was not enlarged and was very mobile. On examining the specimen, the cervical canal was found occupied by a papillary tumor extending to the os internum. Under the microscope, the mucosa was the seat of inflammatory thickening in the form of bands; these on section showed groups of grayish tubercles, with masses of well formed giant cells. Six sections were examined for bacilli with negative results. Lewers expresses the belief that cases of this kind may explain the occasional instances of apparently spontaneous cure of cancer.

It is evident that several varieties of this form of tuberculosis are met with—the ulcerative, which is the most common; the papillary, or budding, which Emanuel considers to be characteristic

of cervical tuberculosis; miliary tuberculosis; and lastly, the "bacillary catarrh" of Schütte.

As Martin observes, it is remarkable that even in the puerperal uterus, in which the cervix has undergone considerable trauma, this portion, as a rule, presents no tubercular lesions, while those of the tubes are far advanced. Is it the tenacious secretion of the cervical mucosa, or, as Vassmer believes, the thick epithelial layer here which opposes the penetration of the bacilli? This point, says Martin, remains unsolved as yet. Menge experimentally infected the cervical canal with many different varieties of bacteria and found it sterile twelve hours later.

Merletti (quoted by Amann) made some interesting experiments with uterine secretions obtained through the canula. *He was able to obtain results in cases even when no tubercle bacilli could be detected in the discharges.* Inoculations made with the fluids thus obtained, showed the existence of tuberculosis, not only when the disease involved the uterus, but where the peritoneum was affected. Hence, positive results from inoculations do not always indicate genital tuberculosis; they may be due to peritoneal disease but the inoculation should be made in every suspicious case, as it involves no risk to the patient and when positive shows the disease in some portion of the tract.

Fraenkel was the first to point out that tuberculosis of the cervix may exist in the same subject with similar disease of the tubes and the intervening fundus be entirely free. Sinclair has also pointed out a somewhat similar predilection. In tuberculosis of the fundus, the disease seldom extends to the os internum, while conversely, carcinoma of the cervix as seldom extends up through the os.

Beyea, in addition to his own case, collected 68 others of tubercular infection below the internal os, from the literature. Thirty of these were discovered at the necropsy, with far-advanced lesions of the genital tract, and distant parts. Two were post-mortem discoveries of primary cervical tuberculosis. Twenty-two were clinical cases—of these 3 were associated with lesions in other parts of the genital tract, and distant parts of the body, four with lesions in distant parts alone, nine were restricted to the cervix; in 19 cases of the total 69, the disease was localized in the portio vaginalis; in 6 in the cervical canal; in the remaining 44, both portions were involved. These statistics impress on us how frequently the disease is overlooked and how frequently the disease is limited to the cervix uteri.

Ulcerative Form.—This may be met with as large or small ulcers occurring over the vaginal portion or cervical canal. When large they are usually single, and when small, multiple. In some cases, the entire portio vaginalis is eroded and excavated. The ulcerative process appears to commence near the os externum and spread over the vaginal portion and up the canal. When the ulcers are large, they are scooped out, but with abrupt edges. The cervix is quite generally hypertrophied. The bed of the ulcer is lower than the margin, differing from cervical erosions or ectropium of the cervical mucosa.

Papillary Form.—In this variety there is great hyperplasia, forming a fungous mass or masses of a pink color, and occasionally reaching a great size, as in Emanuel's case, where it was as large as an apple. In the advanced stages, these masses may be partly cast off, leaving a surface covered with tubercles. Fraenkel compares these proliferations to the similar ones frequently found on the nasal mucous membrane. The mass bleeds readily and bears a close resemblance to carcinoma, and to increase the confusion, Alterthum, in one case, discovered in addition to proliferations of the surface and gland epithelia, concentric imbricated deposits of cells, resembling the "epithelial pearls" of cancer. Tubercular changes were recognized with great difficulty, and the microscopic picture much resembled that of carcinoma. The cervix is always hypertrophied, irregular and elastic.

Miliary Form.—Tubercles may be found scattered over the portio vaginalis, cervical mucosa and in the stroma of the cervix. Associated with this form, there usually occurs diffuse formation of granulations, with a tendency to fibrosis in some cases. These granulations may become conglomerated, softened and an ulcer results.

Bacillary Catarrh.—In this variety, pointed out by Schütte, the process is limited to the surface epithelium and the glands, which may be filled with caseous material, containing numerous bacilli.

As regards microscopic appearances, we find many variations in cervical tuberculosis, depending on the stage of the process and the form of the disease. Tuberculosis of the cervical mucosa manifests itself primarily by a proliferation and metaplasia of the surface and glandular epithelium. The gland lumen becomes occluded by division of the lining cells. In cases like the one of Alterthum, already alluded to, where the microscopic appearances closely resemble carcinoma, a large number of slides must be examined until the tubercular nature is positively demon-

strated. In the beginning of mild forms of cervical tuberculosis, the infiltration of small cells may be limited. After the glandular lumen is obliterated by proliferation of the lining cells, the glands appear as solid columns. As the disease progresses, the metaplastic cells show retrogressive changes, finally ending in necrosis and caseation. Giant cells are only occasionally encountered in the gland proper. According to Emanuel, the cervical glands and stroma may also hypertrophy in the tubercular process and resemble the section of an adenoma.

As the degeneration of the epithelium progresses, granulations take its place, and the cervical mucosa is now covered with granulation tissue in which only glandular debris may be recognized. Giant cells and tubercles are now observed. More or less hypertrophy of the connective tissue is seen in nearly all forms, coexisting in the more chronic forms with areas of caseation and necrosis. In the papillary form, the fungous growths are made up of granulations and new formed connective tissue, in which are bloodvessels, giant cells and tubercles in addition to diffuse epithelioid cell formation.

Symptoms and Diagnosis.—In this, as in the other forms of

DIFFERENTIAL DIAGNOSIS (WHITACRE).

Uterus	Tuberculosis	Epithelioma
Size	Small	No regularity.
Aspect	Papillary form—muriform mass with small vegetations in the vicinity	Usually fungous. The cavity form lacks granulations in the edges. Never solely interstitial.
	Ulcerative—surface covered by caseous material and mucus; border seed bed of granulations	
Touch	Papillary—surface knobbed, smooth, polished, elastic, no induration; limits not clear	Surface roughened; consistence very hard. If large and fungous, the base is very hard.
	Ulcerative—depression without diffuse infiltration; border granular	
Color	Papillary—rose-red; deeper color than surrounding	Grayish.
	Ulcerative—bottom yellow or red	
Spontaneous pain	Little or none	Characteristic.
Sensitiveness	Present	Absent.
Bleeding	May be slight in both papillary and ulcerative form	Frequent and abundant.
Discharge	Papillary—mucous	Fetid and abundant.
	Ulcerative—often purulent	
Progress	Papillary—extremely slow	Progressive and accompanied by constitutional symptoms.
	Ulcerative—slow, yet may produce extensive ulceration and fistula	
Pathologic histology	Both show typical miliary tubercles and tubercle tissue	Typical epithelioma with pearls and columns of pearls.
Bacteria	Tubercle bacilli found in smear preparations or by inoculating guinea-pig	None.

genital tuberculosis, the disease is most active during sexual life. The ages in 58 cases, as given by Beyea, are as follows: 17 to 20 years, 6 cases; 21 to 30 years, 27 cases; 31 to 40 years, 9 cases; 41 to 50 years, 5 cases; 51 to 60 years, 5 cases; 61 to 70 years, 3 cases; 71 to 79 years, 3 cases.

The subjective symptoms are vague. The patients usually complain of a profuse leucorrhea, purulent in character and occasionally tinged with blood and a peculiarly offensive odor, but not like that of malignant disease; this was present in 24 of 37 clinical cases. As regards menstruation, it was normal in 3, absent in 12, and profuse in 13 cases.

Clinically, the differential diagnosis between erosions, inflammatory proliferations and commencing carcinoma is sometimes exceedingly difficult. In suspected tuberculosis, we should look especially for small nodules, areas of caseation and ulceration; not finding these, a portion should be excised for microscopic examination. Beyea observes that, as in early carcinoma of the cervix, the diagnosis of tuberculosis must be always that of suspicion, to be made positive by microscopic examination of the fragments removed by cutting and not by the curette; also by inoculation of fragments into guinea-pigs.

The unsatisfactory nature of the symptoms may best be judged from the clinical diagnosis of 56 cases given by Beyea. In 14, it was carcinoma or suspected carcinoma; in one, sarcoma; in 4, ulcer of the cervix; in one, ulcus rodens; in one, vegetative growth of cervix; in one, indefinite cervical disease; in 28, phthisis or tubercular peritonitis; in one, tubercular meningitis; in one, apoplexy; in 2, abdominal tumor; and in one, caries of spine.

Treatment.—Frank and Emanuel believe it best to remove the uterus. Michaelis distinguishes between primary and secondary genital tuberculosis. He advocates curettement, if the uterus alone is involved, without the adnexa. In the secondary forms, a radical extirpation, provided the patient's condition will permit.

From Beyea's statistics, we learn that 15 cases have been treated by surgical measures; ten panhysterectomies; one curettement, combined with amputation of the cervix and double salpingo-oophorectomy and four, by amputation of the cervix.

Of the hysterectomies, three died from shock, phthisis and tubercular peritonitis. Of the remaining seven, the majority (six), were well after 5½ years; in one, only four months had elapsed.

The case of curettement, amputation, etc., was apparently cured

sixteen months after the operation. Two of the amputations of the cervix recovered and two died of phthisis.

Local applications were made in eleven cases, one is said to have recovered, five improved temporarily, and in five the disease progressed. In the cases where the cervix alone is involved, amputation of the cervix is ample. An operation, as panhysterectomy, which gives a mortality of 30 per cent., should not be performed, except in the rarest instances. Curettement, with cauterization by 30 per cent. chloride of zinc solution, applied by a saturated gauze tampon, which should be allowed to remain 36 hours, gives good results, and if the disease shows return, it is in a small area and favorable for extirpation. It has the same effect as a preparatory cauterization for extirpation of the uterus in carcinoma of the cervix.

SECTION V. TUBERCULOSIS OF THE FUNDUS UTERI.

Frequency.—This form is the most frequent, after tuberculosis of the tubes.

Merletti, in 172 cases of genital tuberculosis, found well-marked lesions of the uterus in 75.

Stolper, in 34 necropsies on tuberculous women, found uterine tuberculosis in 3, and Wolff, in 17 similar necropsies, found uterine tuberculosis in 3 also.

Vassmer, reporting 6 cases of tuberculosis involving the uterus, in 5 of which diagnosis was established by the curette, states they appeared at the clinic within ten months.

Cullen, in eighteen months, diagnosed 6 cases from the clinic, and in Martin's clinic at Greifswald, where the mucosa is examined as a matter of routine, in some 1,500 cases tuberculosis was found 24 times.

Cases.—Hofbauer reported a case in a woman of 57. The patient felt well until the preceding few months, when she noticed loss of appetite and weight. There had been a whitish discharge, without odor, but at times mixed with blood; no pain or feeling of weight. The uterus was enlarged, the mucosa covered with granulations containing tubercles and giant cells.

In Frank's case, in a virgin of 21, there was tuberculosis of the uterus secondary to lesions of the lungs. The patient complained merely of amenorrhea.

Von Hauschka narrates what he believes to be a case of primary uterine tuberculosis. A patient of 18 had profuse leucorrhea, and

the attending physician believing it to be due to metritis, curetted away much yellow caseous material and pus. She was then removed to the hospital and a hysterectomy performed. The uterus was enlarged, the mucosa was infiltrated with tubercles extending into the muscularis but not reaching the serosa. The mucosa of the tubes was also involved, the ovaries, apart from some follicular degeneration, were healthy, and the peritoneum and intestines were free from disease. Recovery. As a careful examination failed to show any signs of tuberculosis elsewhere, the author believes he is justified in his opinion that this was a case of primary uterine tuberculosis.

Pathogeny.—Since the observations of Pozzi and Walther, uterine tuberculosis has been divided into three varieties: miliary, ulcerative, and pyometra (mixed infection). Stolper, however, claims that these are but stages of the same process and that they may all be present at the same time. It can readily be seen that the ulcerative form may occlude the cervix, giving rise to hydrometra and eventually (from secondary infection) to pyometra (Frerichs, Orthmann, Krziwcki).

In practically all the published cases the lesion in the uterus is secondary to one in the tubes, hence the portion of the organ about the orifices of the latter is most often invaded.

The frequency with which the uterus is involved, compared with the tubes, is attributed by various authors to the changes incident to menstruation. Stolper agrees with this, and states that it is apparently confirmed by the fact that tuberculosis of the fundus is much more frequent before puberty and after the menopause. Sippel points out that the mucous lining of the tubes with the numerous folds is much better fitted as a lodging place for the bacilli than the smooth uterine mucosa, with a rich glandular secretion and subjected to monthly changes. In childhood, the delicate epithelium seems to afford but a limited resistance to the penetration of the bacilli.

The miliary form has been met less frequently than the others, but no doubt it has often been overlooked on account of the inconspicuous character of the lesions. Small tubercles are scattered over the mucosa; later on ulcers make their appearance and the mucosa may be partly or completely destroyed. In severe cases, the mucosa is wanting and its place is taken by granulation tissue. The muscular layer often remains intact for a long time, but in extreme cases, it also is partly absorbed, leaving merely a fibrous bag containing thick pus and caseous material.

In our monkey experiment No. 2 it shows that the tubercular process may extend deep into the muscular layer of the uterus into the body of the muscle coat from the peritoneal side, but it does not completely traverse the muscle coat. This would indicate that it is possible that the uterine mucosa might become infected from the peritoneum by direct transmission through the uterine wall. We were unable to find in the literature the report of a post mortem showing this condition in the human, nor was a case reported in which a primary tuberculosis of the uterine mucosa penetrated the muscularis to the peritoneum. So that it is fair to assume that this is at least not a frequent route of transmission, either from the peritoneum to the mucosa, or vice versa.

The uterus may be not at all or but slightly enlarged. Again, it may be considerably increased in size and fluctuate from retention of contents just described. There is, as a rule, some malposition.

Tubercular infection may invade a mucosa which is already diseased. Thus, it has been seen to complicate cancer and ordinary polypoid growths. In 24 cases of uterine tuberculosis in Martin's clinic, 3 were complicated by myoma and 1 by cancer.

Concerning the microscopic changes it may be said they are first manifested in the glands. The cells assume a cuboidal shape and the nucleus moves toward the center. These glandular cells proliferate and in places project as papillæ into the gland lumen, which is frequently entirely obliterated. In the early stages, there may be proliferation and metaplasia of the surface epithelium; later on, however, degenerative changes occur as in the glands. Giant cells may also be observed in the glands, in rare cases, and an infiltration of small round cells has been observed between the proliferating glandular cells.

Associated with the above process is a series of interstitial changes—small-celled infiltration, with formation of epithelioid and giant cells. In very acute cases, giant cells and inflammatory changes minus the tubercle formation may be the conspicuous changes. The infiltration extends progressively towards the muscularis, the superficial layers of which are involved in the tubercular process. Finally the entire surface becomes caseated.

Relations to Pregnancy and Parturition.—While tuberculosis of the uterus may manifest itself from 9½ months to 64 years (Polano), it is more frequent in multiparæ. In five out of six cases of Polano, the affection, according to the patients, dated back to childbirth. The explanation of this is that during

parturition, bloodvessels rupture, the circulation is interfered with and the formation of thrombi furnishes soil for the tubercle bacilli in the circulation. Again, arteriosclerosis is more common in multiparæ and this disease of the uterine vessels manifests itself especially at the menopause.

Can pregnancy in a tuberculous uterus go on to full term? From the researches of Kochel and Schmorl we must answer this in the affirmative. Schull, another observer, reports a case in which he found caseous material and tubercle bacilli in a pregnant uterus, the fetus being still alive. That pregnancy in such a uterus is not without danger is shown by Casper's case, in which a pregnant uterus ruptured spontaneously as a result of tubercular softening, at the end of the third month.

A tuberculous placenta may give rise to acute miliary tuberculosis, as proven by Ausche's case, where a woman, moribund with phthisis, died three days after childbirth. Tuberculosis was demonstrated in the placenta. The child died 26 days after birth, and the necropsy showed tuberculosis of the liver, spleen, lungs and kidneys. Bacilli were found in all these organs.

Finally, preexisting tuberculous disease usually lights up during pregnancy and the puerperium, or may first manifest itself at these times, and, as before stated, tuberculosis may give rise to extrauterine pregnancy.

There is nothing striking or pathognomonic about these. In short, they may be said to be those of ordinary endometritis. Menstruation may be regular, suppressed (as is so often seen in phthisis), or profuse. As might be supposed, from the disease process occurring in the uterus, a profuse leucorrhea is the rule, but even this is sometimes wanting. The diagnosis in most cases must be cleared up by an examination of the uterine scrapings.

The profuse and intractable leucorrhea of both extremities of life are very frequently due to tuberculosis of the uterine fundus. The persistent and profuse leucorrhea of girls from 4 to 14 years of age occurring rather suddenly and resisting local vaginal treatment, should always be suspected as tubercular in origin, and careful examinations of the leucorrheal discharge should be instituted. If these are negative, curettements should be made to determine the presence of bacilli. At or shortly after the menopause, profuse ichorous, irritating leucorrhea, without hemorrhages, should be considered as indicative of tuberculosis of the fundus uteri, and careful microscopic examination of the secretions and

curettement products should be made. In an enormous majority of cases, these young or aged subjects are allowed to go on for years suffering from a curable disease, if the diagnosis had been correctly made. It is, however, overlooked or not thought of in most of the cases.

Treatment.—This is somewhat unsatisfactory so far, on account both of the difficulties in the way of early diagnosis, and of the lack of unanimity among operators as to the proper course to pursue.

Several authors—Sippel, Walther, Halbertsma and Munchmeyer—report cases of recovery from merely curetting. Other operators, among them Doderlein, Schauta, Pozzi and Fehling, look on this procedure as only palliative and not to be resorted to save when the patient's conditions will not permit extirpation.

Since spontaneous healing of uterine tuberculosis is unknown, and complete removal by scraping is practically impossible, radical operation seems indicated. If the menopause has not been reached, the possibility of future conceptions must be taken into account. In a few cases, hysterectomy has been followed by acute miliary tuberculosis. The vaginal route seems preferable, since there is less interference with the peritoneum. In any event, the tubes and ovaries should be removed at the same time as the uterus. In children, where the resistance to tuberculosis and tendency to repair in all of the tissues is great, hysterectomy should be considered a *dernier ressort* and only applicable to cases where the most careful and painstaking curettements and zinc cauterizations have failed.

SECTION VI. TUBERCULOSIS OF THE FALLOPIAN TUBES.

Frequency.—This is by far the most frequent variety of genital tuberculosis and is usually bilateral.

Schramm, in a series of 3,386 necropsies on females, found tuberculosis of the tubes reported in 34. Von Winckel, in a similar series of 575 necropsies, found 5 cases, and Donhoff, in 509 necropsies, 14 cases.

Frerichs, in 76 necropsies on tuberculous women, found the tubes involved in 12, and Von Rosthorn (Vienna), in 40 necropsies on tuberculous women, found the tubes involved in 2.

In 620 cases of salpingitis, observed by Martin, 17 were tubercular; in 103 by Von Rosthorn (Prague), 5 were tubercular; and in 91 by Williams, 7 were tubercular.

Maas, in reporting a case of tubal tuberculosis in a child, directs attention to the infrequency with which it occurs in the tubes at this age, while common elsewhere. After searching the literature carefully, he found but seven cases, his own making the eighth. The latter was in a five-year-old girl, dying of general tuberculosis. There were tubercular ulcers on the mucosa of the uterus and tubes; the muscularis of the former was normal; that of the tubes was filled with tubercular nodules. The ovaries were normal. The author remarks that the source of infection here was very obscure; coitus, unclean instruments, etc., could be excluded; besides, the vagina was not involved. Old fibrous tubercles were found along adhesions extending from the umbilicus inward to the parietal peritoneum, and he believes the umbilicus was the portal of entrance for the infection.

The case cited at the end of this chapter illustrates a common type of tuberculosis of the tubes in children and the results that can be secured by the conservative treatment.

Kraus gives details of an extremely interesting case in a multipara of thirty, with a history of appendicitis 10 years before. A tumor was palpable in the Douglas's pouch, which proved to be an enlarged ovary, and a tubercular tube and vermiform appendix. The tubercles were confined to the distal end of the Fallopian tube, and the adherent tip of the vermiform appendix. There was an ovarian abscess but no tubercles could be discovered in this organ. This author believes the disease process began in the appendix and extended to the Fallopian tube, possibly along the appendiculo-ovarian ligament.

Kundrat states that in 140 hysterectomies at the Göttingen clinic during three years, tuberculosis of the tubes was found four times:

1. Nullipara of 22; family history of tuberculosis and scars of suppurating cervical glands.

2. Multipara (9 births), 43 years old; treated for a long time for tubercular peritonitis.

3. Multipara (9 births, 2 abortions), 31 years old; the disease began after childbirth and, as a most complete examination failed to reveal any other focus, Kundrat believed this to be a case of primary tubal tuberculosis.

4. Multipara of 36 years; this case is very unique, in that there was a cancer of the cervix co-existing with tubercular salpingitis.

Pathogeny.—As Hegar pointed out some years ago, the tubes are predisposed to tuberculosis by their spiral form and pleated

mucosa, which favor stagnation of secretions. A preliminary catarrh seems to enhance the dangers of infection. The sources of the latter are numerous—from the peritoneum, through the blood or lymph vessels, and from outside the body In our opinion the normal constriction and valves of the tube about 5/8 inch from the uterus favors the arrest of bacilli at this point. Clinically this is the most frequent area involved and the pathologic changes indicate that it is the primary focus in the tube. It is also at this point that the gonococcus infection is arrested and retained sufficiently long to destroy the mucosa and produce the stricture, which is the most prominent etiologic factor of gonorrheal pyosalpinx.

Pinner's experiments show that fine particles, such as lampblack or vermillion, introduced into the abdominal cavity, find their way through the tubes into the uterus. We might *à priori* expect the tubercle bacilli to be similarly transported and no doubt they are in some cases. However, in numerous instances the peritoneum is free from tubercular lesions; again, the latter may be extensively diseased and yet the tubes not be involved, as illustrated by the following case:

Mrs. B. McW. Housewife. Aged 23. Admitted to Mercy Hospital, August 17, 1903.

Family History.—Negative.

Personal History.—Has been married two years; never pregnant. Menstruation began at 15; was regular; lasted four or five days; not painful, until after present trouble began. Health has always been good. Weight 144 pounds.

Present Illness.—Two years ago last July (July, 1901), patient was attacked with a sudden and severe pain in the right lower abdomen. It was accompanied by nausea and shortly followed by elevation of temperature. There was great sensitiveness in the right iliac region. With the onset of the pain, patient had a constant desire to urinate, and when she did the quantity was small and it caused great pain and burning. The pain in the abdomen, which was cramping in the beginning, gradually subsided to a dull, aching pain, and persisted for one week. Urinary irritation lasted the same length of time. She had to be catheterized a number of times. The vomiting lasted but two days. The bowels were constipated for a week. The patient gradually recovered from the soreness in the abdomen, but she never felt "quite well" after that date. Two months later she had a similar attack, accompanied by vomiting, but not by the urinary irrita-

tion. This attack lasted about a week; since then she has had similar attacks every month or two not always accompanied by vomiting. Occasionally the pain, during the attack, was felt in the left lower abdominal region. The last attack came on a week ago. This was more mild than usual. During the attack, she felt most of the pain on the left side, with some soreness on the right. There was no nausea, nor vomiting with this attack.

Since July, 1901, patient has had cramp-like pains during menstruation; otherwise the menstruation has been the same as previous to this attack, both in duration and quantity. There is an absence of leucorrhea.

Operation.—Appendix removed and found enlarged; covered with tubercles on the outer surface, but not perforated. It was not fixed by adhesions to the caput coli. It was about twice its normal diameter and its wall was infiltrated. Whether this was from the infection from within, or from the tubercular infection from without, it was impossible to say. There was no tuberculosis of its mucosa.

Median incision was then made and both tubes removed. They were both constricted by a firm band at the base of the fimbriæ. This constriction would only admit the finest probe. It was not a complete organic stricture. The tubes were enlarged about 50 per cent. There were no tubercular nodules discernible and no areas of infiltration on the mucosa. The end of the right tube was more firmly contracted than the left and a few of the fimbriæ were adherent and turned in. They presented the appearance of a wheat sack where the string is tied on the end. This is a characteristic appearance where the tube is free in the peritoneum and not infected with the tubercular material.

Microscopic examination of the tube showed a number of classic tubercles on the peritoneal surface. There was no evidence of tuberculosis either on the surface of the fimbriæ, or on the mucosa of the tube. The constriction at the base of the fimbriæ to occlusion, was due to an extensive deposit of connective tissue at the base of the fimbria. Why this tissue was deposited, I will not attempt to explain, but it is a classic condition and appears to be a result of reflex contraction of the tube as a primary condition and secondary cicatricial and peritubal infiltration and fixation. The contracting bands appear in the peritoneal and subperitoneal tissue and not on the mucous side. Is this the result of the effort of the tube to prevent the admission of the tubercle into the tube, or is

it a favorite location for peritubal infiltration? It appears to me as the former, it being such a classic pathologic condition.

The abdomen was closed without drainage and patient made an uneventful recovery.

In only a few cases of tubercular peritonitis in our experience, in which the fimbriated end of the tube was free, was there an absence of tuberculosis of the tube, and in these cases there were annular occlusions of the tubes at the base of the fimbriæ. Often the tube on the other side had its fimbriated end closed. When the fimbriated end is sealed and the infection is a descending one, from the peritoneum primarily, it can be seen that the tubes should be free from tuberculous disease.

EXPERIMENTS ON MONKEYS.

In order to demonstrate that the disease is transferred from the peritoneum to the tubes, the following experiments were performed on monkeys:

Monkeys were selected, first, for their well-known susceptibility to tuberculous infection; second, because their bodies are erect, more like the human, thus tending to the accumulations of peritoneal pathologic products in the pelvis, and third, because the genital organs—that is, the tubes, ovaries and uterus—in their anatomic conformation, are like miniature human organs.

Monkey No. 1. Female. First operation, October 8, 1902. Peritoneal cavity opened and a healthy ovary removed from Mrs. M., transplanted in and on right broad ligament. The ovary had been removed thirty minutes before transplantation and kept in warm normal saline solution. It was split longitudinally through half its thickness and placed on the edge of the broad ligament, with half put under the peritoneum through an incision. Secured in position with a few fine catgut sutures. Abdominal wound closed in layers with catgut and skin approximated with a subcutaneous catgut. Primary union followed.

Second Operation.—November 8, 1902. Abdomen opened through scar of first operation. (*a*) Ovary found firmly attached to right broad ligament in position in which it was placed at first operation. Surface of ovary was of a grayish-white color and showed evidences of blood circulation. It was separated from broad ligament and hemorrhage followed the separation. Adhesion to ligament was evidently organic; the ovary bled when incised and looked normal. Ovary submitted to microscopic examination by Professor Zeit and pronounced normal in every re-

spect. (*b*) On this date, November 8, the abdomen of this monkey was infected with an emulsion of caseous tubercular cervical glands, removed from Miss H. S. an hour previously. It was injected into the peritoneal cavity and wound closed as in first operation. The emulsion was made by triturating the fresh gland with equal parts of glycerine and water. Primary union followed. Monkey died December 2, 1902.

Post-mortem examination, made by Dr. W. A. Evans, showed the following:

"The body is that of a small rhesus monkey; female. It is quite badly decomposed. There is no evidence of tuberculosis in any of the thoracic viscera. The peritoneum shows most extensive tuberculosis. The omentum is diffusely thickened and yellow tubercle nodules are very abundant throughout. There are no naked-eye tubercles in the liver, the spleen or the kidneys. There is little evidence of tuberculosis in any of the structures in the upper part of the abdominal cavity. The picture is different in the lower part, where everything is in a solid mat. There is a moderate accumulation of fluid in the peritoneum. The intestines show no tubercular lesions in the mucosa that can be recognized by the unaided eye. The bladder mucous membrane shows no breaks. The wall is thrown into multiform projections. Sections were made of these. The uterus and tubes are imbedded in masses of tubercle tissue. Sections were made of the uterus and tubes. It is very apparent that tubercle infection occurring in any portion of the abdominal cavity of the female monkey tends to more exaggerated expression in the pelvic peritoneum. The same is true in the human, except so far as the omentum is concerned. It, when infected, becomes a thickened mass with caseous nodules and much connective tissue infiltration. A section of the right Fallopian tube at the uterine horn shows no evidence of tuberculosis. There is no lymphoid hyperplasia. The epithelium is piled up in more layers than is usual in the human subject. There is a much simpler arrangement of the arborization, simple nonbranching papillary projections being the rule. In the underlying tissue we find no giant cells, no focal necrosis and no great connective tissue hyperplasia."

We conclude that the tubercular infection did not enter the tube and uterus from the fimbriated end.

Monkey No. 2. Female. Operation No. 1, Jan. 21, 1903. Peritoneal cavity opened. Small portions of a carcinoma colloides of the peritoneum (Zeit), which had been removed from

the omentum of Mr. C. H. K. thirty minutes previously, together with several grammes of ascitic fluid from the same case, were placed in the peritoneal cavity. Wound closed as in monkey No. 1. Primary union followed.

Operation No. 2 on the same monkey, April 25, 1903. Abdomen opened through scar. (*a*) Scattered over the visceral peritoneum and omentum were small nodules about ⅛ inch in diameter, six or seven in all. These were imbedded in the tissue and showed no inflammatory reaction around them. Three of them contained small worm-like bodies, round, white and curled in half circles. The other nodules were grayish-white; no fluid in peritoneal cavity. Peritoneum elsewhere normal. Several nodules removed for examination.

Microscopic examination showed no evidence of perpetuation of the malignant growth. Two kinds of solid tissues were found. No. 1, the rolls above referred to, consist of heavy fibrous tissue, that has undergone hyaline infiltration; in the center of some of these is illy-defined tissue which takes a diffuse blue mist hematoxylin. This may have been and probably was the original inoculating material, now undergoing degeneration. No. 2, lymph nodes, new and of various sizes (Evans).

April 26, 1903, after removing specimens above mentioned, from the monkey, small pieces of triturated tubercular glands, removed one hour previously, were placed in the peritoneal cavity, together with several drachms of emulsion of glands in sterile water. Wound closed as usual. Primary union followed. Glands were removed from neck of J. F. McD. Monkey died June 7, 1903.

Post-mortem examination made by Dr. W. A. Evans showed:

"This is a badly decomposed female monkey of the rhesus variety. Post-mortem examination shows the thoracic viscera negative as to tuberculosis. The peritoneum contains an excess of fluid. The omentum is a thick hyperplastic mass and is closely adherent to the pelvic structures. No nodules are to be found in the liver. There are a few nodules, from the size of a pinhead to that of a pea, in the spleen. The kidneys are negative. There are a few tubercular nodules in the peritoneum. The enteric folds show a few nodules, but there are very few adhesions anywhere in this region. The colon also shows a few nodules, but no adhesions. We strip the entire abdominal and pelvic contents from the wall and remove it en masse. Posteriorly, in the upper areas, there are a few glands; these are small, showing

that the *subperitoneal glands become infected from the peritoneum.* In the lower abdominal segment and in the region of the pelvic viscera, the lymph glands are very large and distinctly tubercular. The pelvic viscera are matted together in a solid tubercular mass. The bladder mucosa shows no breaks. The bladder function necessarily was greatly interfered with by the extensive tubercular hyperplasia of all the surrounding structures. Section was made on the left side so as to show in the same slide some of the uterine mucous membrane and that of the Fallopian tube. These, to the unaided eye, did not seem tubercular."

This specimen confirms the others in that it shows the tendency of tubercular infection of the general peritoneal cavity to locate in the pelvis in the female monkey.

Sections of the bladder-wall show that the mucosa is piled up by muscular contraction. There is no tuberculosis in the mucosa nor in the muscular tunic. *Even with extensive pericystic tuberculosis, the bladder wall resists invasion.*

A section of the uterine and Fallopian tube walls shows that there is no tuberculosis in the mucosa of either. The muscular tunics are not involved, though there are tubercles of the caseating type on the serous coat, showing that the muscular wall is not attacked from the serosa, either in the uterus or tube.

A transverse section of the uterus shows the following:

The mucosa consists of glands and lymphatic tissue in about the same proportion as in the human subject. The glands are of the same structure as in the human subject. There are no evidences of any pathologic processes in this mucosa. External to this is the muscular coat, containing more cells than normal, but with no histology that suggests tuberculosis. Still external to this, is a thin circular layer of fibres; this frequently serves as a boundary. External to it are tubercles that show all the histology of tubercular nodules. These nodules are usually caseated. In certain areas the tubercular process is extending from the periphery across tnis circular boundary layer and into the body of the muscle coat. It does not completely traverse the muscle of the uterus in any portions of our section.

Monkey No. 3. Female. Operation, April 25, 1903. Small pieces of tubercular gland and several drachms of emulsion of gland in water placed in peritoneal cavity. Glands removed one hour previously from the neck of J. F. McD. Wound closed as in Monkey No. 1. Primary union followed. Monkey died June 11, 1903.

Post-mortem examination by Dr. W. A. Evans:

"The pathologic findings in this experiment showed diffuse coalescent tuberculosis of the peritoneum, involving the entire lower half of the abdomen. There were many adhesions. The tubes, uterus and pelvic peritoneum were matted. The fimbriated ends of the tubes were sealed with the general adhesions. A careful microscopical examination of the mucosa of the tubes and uterus failed to reveal any evidence of tuberculosis."

The peritoneum and walls of the viscera in this experiment showed a more destructive attack by the tubercular process, that is, the peritoneum was of the ulcerative and adhesive variety, rather than of the serous variety, notwithstanding it was the same material taken from the same trituration and practically the same quantity as that in monkey No. 2. This shows that infections of the same virulence and type may produce different tissue changes; and, in this case, we feel we are justified in attributing this difference in degree of destruction to the difference in resistance afforded by individual monkeys. These results correspond with the clinical manifestations of tuberculosis, not alone in the peritoneum, lung and other tissues, *i.e.*, the destructive effect of a tuberculous infection depends rather on the power of resistance than on the special virulence of the infection.

General Comments on Monkey Experiments.—These experiments were undertaken to determine, (*a*) what portion of the peritoneum would be most surely attacked with tuberculous material, placed in the middle of the abdomen; (*b*) what lymphatics would take up the tuberculous material and what glands would arrest it; (*c*) would the bacilli be taken up by the tubes and would the mucosa of the tubes, uterus, or vagina become infected through this route? (*d*) would the tuberculous infection of the peritoneum produce a destruction of the walls of the abdominal viscera, through to their mucosa? (*e*) would tuberculous material placed in the abdomen be carried by the general tendency of the lymph current in the direction of the diaphragm, or would it settle in the most dependent portion of the abdomen in the monkey, as it appears to do in the human, regardless of the position in which it is primarily placed in the peritoneal cavity? (*f*) would the tuberculous material be taken from the peritoneum through the intestinal walls by ulceration into the lacteals and thence to he thoracic duct and be arrested in the lung, it being the first filter? (*g*) would the bacilli find entrance into the portal circulation and be arrested in the liver?

(*a*) It can be seen from the post-mortem reports that the pelvic peritoneum bore the brunt of the attack almost to the exclusion of the diaphragmatic area and the upper abdominal viscera.

(*b*) The retroperitoneal glands of the pelvis and the postperitoneal glands in the lumbar region were the only glands involved; the mediastinal and postgastric glands were not infected.

(*c*) The mucosa of the tubes was not infected in any of these cases nor was the mucosa of the uterus. This would tend to show that in the monkey the tubes do not take up the tubercle bacilli, or if they do, the bacilli do not find lodgement on these mucous layers. This may possibly be due to the severity of the tuberculous process produced in this manner, causing primary occlusion by adhesion of the fimbriated ends of the tubes, thus preventing the entrance of bacilli into the tubes and I feel that this is an important factor against the involvement of the tubes, that does not exist clinically in many cases in the human.

(*d*) The tuberculous process destroyed the peritoneum, the intestines, uterus and bladder; in the uterus it extended quite deep into the muscularis, but in none of them did it penetrate clear through the walls.

(*e*) Tubercular products placed in the peritoneum of the monkey settle into the pelvis and are not carried by the lymph current and intestinal peristalsis in the direction of the diaphragm.

(*f*) The lung was not tuberculous in any of the cases, as evidence against this mode of metastasis.

(*g*) In experiment No. 3 is may be noted that there was no infection of the liver, but there were a number of miliary deposits in the spleen. It is difficult to say how these arrived in the spleen, but most likely the infection of the spleen was hematogenous, as the tubercles were scattered throughout the spleen and not in its surface, and that there were no transmissions through the portal circulation to the liver.

From the experiments of MacCallum (*Johns Hopkins Bulletin*) it would be inferred that all foreign material placed in the peritoneal cavity moved in the direction of the diaphragm. In our experiments, the tubercular material settled into the pelvis and only here and there was there a nodule formed above the level of the umbilicus. This corresponds also with our clinical observations in tuberculosis of women, the disease in an enormous majority of cases being below the level of the umbilicus. In men, however, the omentum is more frequently attacked though the pelvis of

the male, often shows the most advanced and often the only intraabdominal involvement.

Path of Infection.—Some evidence in favor of the hematogenous route is furnished by Schöttlander's experiments. This observer after injuring the fimbriated extremities of the tubes in rabbits, injected tubercle bacilli into the circulation, and found tubercular changes follow in the abdominal end of the tubes. He is of the opinion that this mode of carriage is frequent, and that the ascending form, through the uterus, is rare. In this connection Amann points out that the blood supply to the tube may be of some etiologic importance. The ascending branch of the uterine artery at the base of the broad ligament gives off a principal branch, the ovarian (anastomosing with the ovarian artery and an accessory branch, the tubal artery). From the ovarian artery, two small branches are given off to the fimbriæ and abdominal end of the tube. Now the blood pressure from the heart to the small arterioles diminishes but slightly, being as 6:5 (Jacobson); in the capillaries, however, according to Donders, the pressure is but half that in the large arteries. The territory between the tubal network of the uterine artery and that of the ovarian artery is very poorly nourished. That the infection of the tubes, uterus and vagina may occur, independent of transmission from below, is proven by the cases of tuberculosis of the tubes, uterus and vagina in imperforate hymen, cited above.

Glimme asserts that the chief avenue of external infection is coitus with tuberculous men. In children and others with hymen intact, infection must, of necessity, be looked upon as coming from the peritoneum. Marchesi, reporting a case of primary tubal tuberculosis in a girl of 19, believed that in his case direct external infection took place and that powdered tubercular material, dust, etc., may enter the genitals of children. In one of Menge's cases, a woman, six weeks after marrying a tuberculous man, had symptoms of inflamed appendages with pelvic peritonitis. Constitutional symptoms of tuberculosis developed so the diseased tube had to be removed.

Other etiological factors may enter into the case; thus, while symbiosis between the gonococcus and ordinary microbes is rare, according to Menge (quoted by Amann), it is not exceptional to see this occur between Neisser's coccus and the tubercle bacillus. If the two germs penetrate simultantously, since the gonococcus grows more rapidly than the tubercle bacillus, the soil for the latter will not be favorable. Schuchardt found tubercle bacilli

in the secretions of two out of six cases of gonorrhea in males. Williams and Saulmann have also demonstrated the simultaneous presence, in the tubes, of tubercle bacilli and gonococci. Zweifel operated on a case in which gonorrheal pyosalpinx was present at the same time as tubercular peritonitis.

Another very potent predisposing factor, as Amann points out, is hypoplasia of the genital tract, first mentioned by L. Voit. In three cases of genital tuberculosis, Hegar and Alterthum found one case of hypoplasia of the uterus, one case of infantile uterus, as well as a tendency to bicornate uterus. Landouzy and Fournier (quoted by Hegar) have often found vices of development in the descendants of tuberculous families. Merletti, in 500 necropsies on tuberculous women, found 80 cases of uterine hypoplasia (35 infantile uterus, 2 bifid uterus, and 43 small uterus) and in 24 out of these cases, genital tuberculosis existed. This author considers hypoplasia as a necessary consequence to the cardiovascular hypoplasia so frequent in the tuberculous with hereditary disease. In order to give an idea of the frequency of hypoplasia in the tuberculous, Merletti reports that of 549 patients examined during the year at Parma, Italy, uterine hypoplasia was found 17 times (3.01 per cent.) and of 353 patients examined at Padua, uterine hypoplasia was found 36 times (10.2 per cent.). The latter city is noted for its numerous cases of tuberculosis. This observer believes that uterine hypoplasia predisposed to tubercular infection by favoring stagnation of the secretions. Tillaux and other observers have shown that in the male also, genital tuberculosis is often accompanied by an infantile condition of the prostate, penis and testicle. This is corroborated by Merletti, who, in 34 cases of tuberculosis of the male organs, found poor development of the prostate, evidently congenital, in five and ectopia of the testis in four.

The puerperal state plays as important a role in tuberculosis of the tubes as it does in tubercular diseases of the genital tract.

Lastly tubercular infection of a hydrosalpinx may occur (Schroeder's case from Fritsch's clinic).

In ascending infection, why does the tube become involved, while the intermediate portions of the genital tract—vulva, vagina, cervix and fundus uteri—escape? The answer is the same as that for the well-known immunity of the nose and upper air-passages in pulmonary tuberculosis—the resisting power of these intervening structures is greater.

Pathologic Anatomy.—With Martin and Rosthorn we may

divide tubal tuberculosis into an acute secondary and a chronic primary form. The former is characterized by round-cell infiltration, few or no giant cells, and an abundance of bacteria. The mucosa in this form is rapidly necrosed. In the other form—the chronic primary—the mucosa remains unaltered for a long time, at least, in spots, though swelling is very marked; tubercle bacilli, either absent or few in number; the abdominal end of the tube is frequently sealed up by adhesions, and the serosa covered with miliary granulations in the beginning.

The tubes as, a rule, are enlarged, moderately firm in consistency and the serous covering thickened. They may be covered with false membrane in which nodules may be noticed. The caliber usually enlarges towards the abdominal end (cornucopia shaped); the fimbriæ swollen and frequently with nodular thickenings. The abdominal opening may be patent, partly closed, with a caseous plug protruding from it, or impermeable. In this latter event, a pyosalpinx rapidly forms, which may reach enormous proportions (two litres, Stehmann). If the fimbriated end is open, which is often the case; if its walls are infiltrated with a non-mixed infection, caseous débris is discharged into the peritoneal cavity. As the tube frequently contracts adhesions to the adjoining viscera, cavities may be formed into which these masses are emptied, or become encysted. Finally, by the adhesion of the false membranes to the tube and the viscera, everything is matted together into one mass.

Nodule and Cyst Formation.—The isthmus may be free from any marked changes, especially in the descending variety, or it may exhibit nodule formation. The latter was looked on by Hegar as pathognomonic of tuberculosis, but this is now known to be unfounded. A similar nodular salpingitis of the isthmus is found in chronic gonorrhea. Its origin has been variously interpreted. Rokitansky, Klebs, and others believed the nodules to be small myomata. Chiari thought they were due to hypertrophy of the tubal muscularis. Finally, Amann claims that in nearly, if not all, cases there are remnants of the Wolffian ducts, and Schauta, that, on account of the narrow lumen of the isthmus, the inflamed, swollen mucosa projects into the muscularis, causing hypertrophy of the latter.

These nodes themselves may contain cystic spaces and the folds of the mucosa in the tube proper may adhere to each other, also giving rise to cysts.

Pathologic Histology.—In the beginning we find cloudy swell-

ing of the epithelium; the folds of the mucosa are richly infiltrated with round cells, are very vascular, and thickened with tubercles and giant cells. The muscular layer is free from changes. Later the epithelium exhibits degenerative changes and finally disappears. Necrosis manifests itself, usually in the tubercles at first; finally, necrotic changes and caseation occur through the infiltrated mucosa. The muscularis is now infiltrated and may contain tubercles; atrophic changes are common and newly formed connective tissue has been observed in the muscularis a few times.

A few cases are on record in which the necrosis and caseation involved all the coats of the tube, leading to rupture and escape of the contents into the ovary, as shown in Miss N's history, cited under tubercular abscess in ovary. Calcification is occasionally, though rarely, seen and various stages in the tubercular process may be visible in the same tube. The changes about the ostium abdominale are nearly always more marked than elsewhere in the tube, except near the cornu, and this is the principal point relied on by the advocates of the peritoneum being the source of infection.

Symptoms and Diagnosis.—As the symptoms of uterine tuberculosis are practically those of endometritis, so the symptoms of tubal tuberculosis are those of salpingitis, in general, to which are added those of frequent pelvic peritonitis. Pain is more constant than in any of the varieties of genital tuberculosis considered thus far. It is periodical, localized, though at times diffused, and is usually the reason for which professional advice is sought. Menstrual disturbances are not noticeable. Attention is called by some writers, especially Polano, to a rise in temperature characteristic of this variety. In three of his cases, there was a regular remittent fever, the morning temperature being about normal, the evening rising to 100.4°F.

Alterthum lays stress on the value of nodules palpable through the vagina or rectum. These vary in size from a pinhead up to a bean or larger, and are located in Douglas's cul-de-sac, on the posterior aspect of the broad ligament, the posterior wall of the pelvis, or in the paravaginal tissues. They are usually firm and are sometimes situated so close together that they give the finger the impression of a coarse rasp. Bulius corroborates the value of this sign, but adds that localized thickening at the isthmus is, as a rule, of gonorrheal origin.

In the cases of simple tuberculous infection of the tube, in which the fimbriated end is not adherent, which is the rule, there

is a pronounced periodicity in the acts, accompanied by all of the manifestations of an acute infection of the pelvic peritoneum, viz., soreness, pain, nausea and often vomiting, elevation of temperature from 100° to 102° F., evidence of fluid accumulation in the pelvic peritoneum, great sensitiveness on vaginal examination, with "boggy" sensation of the Douglas fold. This is very pronounced on rectal examination. The uterus and tubes are more movable than in gonorrheal salpingitis. The attack passes off in a week or ten days, to recur in three to six weeks. This periodic pelvic peritonitis, as I have demonstrated in operations, is due to the expulsion of tubercular debris from the tubes into the peritoneum. Unless one is careful in the analysis of the clinical history to note that the soreness precedes the pain, which is never the case in acute appendicitis, the case may be mistaken for one of recurrent appendiceal pelvic infection. The leucocytosis in these attacks is about the same as in pelvic peritonitis of other origin, varying from 12,000 to 18,000. I have never seen this pronounced periodicity except in the cases where the fimbriated end of one or both tubes was free, as illustrated in the following history:

Miss Florence B. Æt 26. Admitted to Mercy Hospital Sept. 21, 1900.

Family History.—Negative.

Personal History.—No previous illness, except a vaginal discharge which has been present as long as she can remember. This discharge was white and mucoid, until lately, when it became bloody, for which she sought treatment. During the last two years, she has had pain in the region of the ovaries, confined principally to the right side; also pain in the back.

Present Illness.—Eighteen months ago, she had an attack of acute severe pain in the lower half of the abdomen. She does not remember whether it was more on the right or left side. A few hours after the onset of pain, patient vomited, and there was a decided elevation of temperature. The lower half of the abdomen was sensitive to pressure; there was some bloating; the doctor did not state that there was fluid in the peritoneal cavity.

The attack subsided in ten days, but from that time she has had considerable soreness when she exercises or works hard.

She has had in all, five similar attacks, all of about equal severity and lasting about the same length of time. In one of these attacks her temperature reached 103° and the physician said there was a mass in the lower right side of the abdomen. This attack was more protracted than the others.

The last attack was five weeks ago. She completely recovered from this.

Examination.—Increased resistance over the lower abdomen on both sides. The sensitiveness, however, is more marked on the right side of the pelvis than the left.

Bimanual examination reveals a moderately fixed uterus; stiffened, but not infiltrated fornices, an increased resistance in the Douglas cul-de-sac, with a nodular mass on the right side. The rectal fold of peritoneum is particularly sensitive and thickened. The tubes could be outlined as enlarged and fixed. The uterine discharge was not examined for tubercle bacilli, nor were inoculations made to determine the presence of tuberculosis.

Operation.—Incision through left rectus. Peritoneum congested; great vascularity on both parietal and visceral layers; considerable serous fluid. The tubes were adherent to the wall of the pelvis but easily detached. Some soft slimy adhesions between the intestines; appendix free from disease. One-half inch from the uterine cornua in each tube was found a firm caseous mass; secondary masses were located at intervals of ½ to 1 inch out to the extremities; there was edema and ectropion of the fimbriæ and beneath the mucosa of the fimbriæ could be seen small white tuberculous foci; caseous masses protruded from the ends of the tubes. In the Douglas pouch the tubercles were confluent; they diminished in frequency as the distance from the end of the tube increased. A few small deposits were found on the surface of the omentum. The tubercles were well defined and surrounded by rings of connective tissue, showing that the tissue was overcoming and encapsulating the tubercular infection. The tubes were removed; ovaries retained; small tubercles were studded here and there on the surface of the ovary, but none of the Graafian follicles were infected with tuberculosis, as far as could be seen. The tubes were removed close to the uterine cornua on the proximal side of the primary and most compact tuberculous nodule. The uterine cornua were not removed. The uterus was normal in size and showed no evidence of tuberculosis. The abdomen was thoroughly sponged and a rubber drain was allowed to remain for 48 hours. (This was a mistake and led to the formation of a ventral hernia for which I operated June 28, 1901.) On this date, ten months after the first operation, the abdomen was opened, the hernial sac incised, and a careful examination was made of the abdominal contents. Every vestige and manifestation of tuberculosis had disappeared. There were no adhesions; there were

no enlarged glands; the stumps of the tubes could be recognized, covered over by cicatricial tissue. The ovaries were normal; the uterus was about the same size as when previously seen. In fact, the peritoneum appeared as a normal peritoneum and one could scarcely believe without seeing, that such complete restoration of the peritoneum could take place after tuberculosis.

This is a striking case, as showing the power of the peritoneum to repair, after the source of supply of the tuberculous material is shut off, namely, the removal of the tube with its tuberculous mucosa. The mucosa of the tube containing it, reproduces tubercle and bears it into the peritoneal cavity, through the open fimbriated end.

June, 1903, patient seen for another illness and states that she has enjoyed perfect health since operation; has had no recurrence of pelvic pain or peritonitis. Menstruation is normal as to time and duration and is painless.

Relations to Menstruation and Sterility.—The cases of Orthmann and Williams show that tubal tuberculosis, even when bilateral, has no effect on menstruation, provided the uterus itself be healthy. In five of Polano's cases, menstruation was regular and not painful, yet the tubes were involved in all five and the ovaries in four.

Sterility seems to be the rule in this variety. Tubal tuberculosis evidently inhibits both ovulation and the ingress of spermatozoa.

Treatment.—The only treatment, according to the weight of evidence, is complete extirpation of the tubes, provided the general condition does not contraindicate. The abdominal route is preferable, as a clear view can be had of the diseased area; the diseased peritoneum can also be treated, and the possibility of a serous sinus less likely, than by the vaginal route. Most operators advise leaving the ovaries, or at least parts of them, to mitigate the inconveniences of the artificial menopause. Fortunately, this can often be done, since the ovaries are rarely interstitially diseased.

Seligman reports a case where lupus of the face and scalp of many years' standing healed up after extirpation of a tubercular tubo-ovarian tumor.

The uterus should not be extirpated with the tubes, unless there is pronounced evidence of disease in that organ. The routine removal of the uterus is a pernicious practice. The abdominal route should be the one of election as the intestines are frequently adherent to the tube and likely to be injured in the separation. This injury would result in a fecal fistula which, if it did not produce

an immediate and fatal result, would be difficult, if not impossible, to repair. If both ovaries contain abscesses, one of them, at least, should be preserved by enucleating the abscess wall out of the ovarian stroma, retaining the latter. This is not so difficult to accomplish as one would imagine, as the tuberculosis in the ovary is usually a single sac, that of a Graafian follicle enlarged, and is easily abated.

The reward for the conservation of the uterus and the ovaries is beautifully illustrated in the following case:

Della C. Æt. 9 years. Came under my observation May 10th, 1893. Gave a history of recurrent attacks of inflammation in the pelvis, extending over a period of four months. The last attack began six weeks ago and since then there has been a rapid accumulation of fluid in the abdomen, so that it is enormously distended. The patient was somewhat emaciated; hectic; the afternoon temperature ranged from 100° to 101.6°. She was not particularly sensitive to abdominal pressure. Hymen intact; utero-rectal fold of peritoneum thickened and sensitive. Diagnosis of tuberculous peritonitis made and section advised.

Operation May 14th. Pelvic peritoneum was studded with miliary tubercles; there were no intestinal adhesions, although the small intestine had here and there many miliary deposits. The tubes were enlarged to about the size of an adult index finger; the fimbriæ were free. The ovaries were not adherent to the tube, although the mesosalpinx was short and held the tube close to the ovary. Both tubes were removed to the cornua; both ovaries and the uterus were retained. This patient has since that time been perfectly well; has developed into a fine young woman. She began to menstruate at fourteen; has menstruated regularly and without pain or discomfort, and although ten years have elapsed and the operation was performed five years before she arrived at puberty, it had no untoward effect on her development, ovulation and menstruation and nervous system. This is quite a contrast to the results after the prebuberty "pan" operations so frequently and unnecessarily resorted to at the present time. Drainage or iodoform should not be resorted to after the section in these cases.

SECTION VII. TUBERCULOSIS OF THE OVARY.

Frequency.—This variety is apparently relatively infrequent. Spaeth, in 119 cases of genital tuberculosis, found 15 cases of the ovary (12.6 per cent.). Merletti, in 172 cases of genital tu-

berculosis, found 27 of the ovary. Orthmann, in 103 cases of genital tuberculosis, found the ovary involved in 33 per cent. The same author collected from various sources 177 cases of ovarian tuberculosis; but 57, however, were confirmed by microscopic examination. Of these 57 absolute diagnoses, 9 were tubercular ovarian cysts and 48 (27 bilateral; 21 unilateral) were tubercular ovaries.

Source of Infection.—The isolated position of the ovary renders the solution of the source of infection of unusual interest. Primary tuberculosis of the ovary is quite unusual. For instance, Schöttlander collected 157 cases, none of which were primary. However, several cases are on record (Oppenheim-Spaeth) in which the focus in the ovary was the only one in the genital organs. According to Wolff, in 60 per cent. of tubal or peritoneal tuberculosis the ovaries are involved also.

There seem to be two sources—the blood-current and the Fallopian tubes and peritoneum. Hematogenous infection has been proven by Schöttlander's experiments, this observer having been able to produce primary tuberculosis of the ovary in animals. In the human being it is especially likely to occur during the course of acute miliary tuberculosis of the lungs, when large numbers of bacilli gain entrance to the blood stream.

The usual mode of infection, however, is by contiguity, or, in some cases, by the lymphatics. Probably the most frequent source is the peritoneum and tubes. In the 48 cases of true ovarian tuberculosis collected by Orthmann and verified by microscopic examination, the infection was traced to the tubes in 26 cases and the peritoneum in 22. Schöttlander states that while the peritoneum is the usual source of infection in some cases the tubes are at fault. According to Wolff, tuberculosis of the peritoneum always spreads to the ovary unless this organ is protected by adhesions.

Schöttlander claims the disease process in the ovary begins as a peri-oophoritis and that the deeper portions become infected through the lymphatics. During ovulation, the periodic rupture of the Graafian follicles acts as a mild traumatism and affords an atrium for the invasion of bacilli. In a case of Orthmann's, incision of a corpus luteum located near the fimbriated end of the tube showed tuberculosis. By dissecting up the adhesions, he found the fimbriæ were likewise tubercular and extended directly into the corpus luteum. In this case tubercular peritonitis was also present.

In a recent case (Miss M. N. See history of this case below) operated on by me in Mercy Hospital, the communication to the Graafian follicle was by direct perforation of the tubal wall, producing in this way a tubo-ovarian tuberculous abscess. The abscess in the ovary was the size of a walnut; its sac was easily shelled out, leaving a comparatively healthy though deformed ovary. In most of the recorded cases of tuberculous abscess of the ovary, when a detail of the pathologic changes is given, the tuberculosis is shown to be either of the peritoneum or the Graafian follicle and less frequently in the stroma of the ovary.

Pathologic Anatomy.—This resembles somewhat the same process in the analogous organ, the testis. Primary tuberculosis of the testis practically never occurs except in general miliary tuberculosis; according to Fritsch's experiments, it does occur in the ovary. Tuberculosis of the testis is otherwise always secondary to tuberculosis of the epididymis. (See article, Tuberculosis of Testis, by author, *Jour. Am. Med. Ass'n,* Nov. 10 to Dec. 8, 1900.) In the ovary it is frequently secondary to tuberculosis of the peritoneum as well as tuberculosis of the tube.

The disease may manifest itself either as peri-oophoritis (disseminated or diffused), or as true ovarian tuberculosis. The latter may be either miliary (the least frequent), caseous, or tubercular abscess. (The two latter occur with equal frequency.)

The miliary form is often undetected by the naked-eye appearances, and may escape notice. According to Guillemain the evolution of the morbid process may be so rapid that it has progressed to caseation etc., before operation. The disease may remain limited to the periphery for some time, as in three of Wolff's cases there were tubercles superficially, but no caseation. This type sometimes pursues a very mild and chronic course. In the majority of our cases, miliary tubercles existed on the surface of the ovary as tuberculosis of the peritoneum and tunica albuginea, showing no tendency to penetrate that membrane to the ovarian stroma.

Caseous foci gradually make their appearance and coalesce. In advanced stages the organ is enlarged, soft, fluctuating, filled with pus and caseous matter. The pus cavities which sometimes reach the size of an egg, are probably due to secondary infection, since streptococci are frequent in the pus, while tubercle bacilli are absent.

The organ may reach enormous size and yet show no signs of softening, as in a case of von Franque's, in which it reached the

size of a fist, and on section was found filled with yellow nodes, the largest the size of a walnut. These nodes were composed of round cells which had partly undergone fatty changes. There were no signs of caseation, but epithelioid and giant cells were seen in the stroma. The tube adhered strongly to the ovary and the abdominal end was impermeable.

In several cases reported by Penrose and Beyea, the parovarium was involved—the first time, according to these authors, that this has been noticed.

Pozzi reports that the right ovary is more often affected than the left, as 5 :2.

In no place in the literature did we find evidence showing the inherent reparative power of the ovary when once attacked by the tuberculous process, how it resists invasion or how it repairs damage already done.

Symptoms.—The cases of primary tuberculosis of the ovary are so few that practically nothing has been learned as to the symptoms. The symptoms in the secondary cases are those of the tubal or peritoneal disease from which it originates.

Treatment.—Since ovarian tuberculosis is either discovered accidentally or complicates tuberculosis elsewhere, it will be removed with the diseased tubes or during the treatment of tubercular peritonitis. If both ovaries are involved in young individuals, in many cases the ovary can be conserved by shelling out the tuberculous Graafian follicles and closing the rent with catgut suture. Many of these may be shelled out of the same ovary and the organ be preserved in practically its normal condition; there is no more reason for removing an ovary because a Graafian follicle or the tunica albuginea is involved than there is for amputating a leg because there is a tuberculous focus in the tibia or even a tuberculous genu-synovitis.

The ovary has rarely been diffusely involved in the tuberculous process in the cases under our observation. The following is one in which the left ovary was the seat of tuberculous abscess and represents the most frequent type we encounter.

Miss M. N., æt. 32, admitted to Mercy Hospital August 28, 1903. Two months ago patient had an attack of pain in the left lower abdomen. Pain was severe and of a sharp shooting character. Did not vomit, was not nauseated and abdomen was not distended. Temperature was not taken. Bowels constipated at this time, as they always have been. Her physician said she had obstruction of the bowels and she was in the hospital for ten days,

but was not operated on. Since then she has had occasional soreness in left lower abdomen when she coughs or laughs. General health good; weight normal.

Previous History.—Since five years ago has had quite profuse leucorrhœa. Patient gets up once at night to urinate and has a little burning during passage of urine. Has had no serious illnesses. Menstruation normal. No history of venereal infection.

Family History.—One sister died of consumption at the age of 22.

Examination of Patient.—Large stature; well nourished. Temperature 99° F. Heart and lungs negative. Abdomen: some tenderness and flatness in left lower quadrant; no masses or tumor to be felt. Kidneys not palpable.

Pelvic Examination.—Reveals a tumor in the left fornix. A mass about three inches in thickness and firmly fixed can be detected by bimanual palpation; there is some induration and infiltration in the right fornix with a small resisting mass resembling a tube. The vesicorectal fold and the Douglas pouch are thickened and sensitive. No fluctuation can be detected. The uterus is partially movable; not materially enlarged and displaced to the right. Leucocytosis 9,000.

Diagnosis.—Left pyosalpinx, with ovarian or perisigmoid abscess; enlargement of right tube.

Operation, August 31. On opening the abdomen, the parietal peritoneum was somewhat infiltrated and studded with well defined tubercles. The number increased in frequency as the pelvis was approached, until, in the latter they were confluent. In the neighborhood of the umbilicus there was about one to the square inch and on the intestine and omentum drawn from the upper portion of the abdomen, they were absent. There were a few ounces of straw-colored fluid in the cul-de-sac. The right tube was somewhat enlarged with a constriction to occlusion one-half inch from its fimbriated end. The fimbriæ were free. The body of the tube itself was free from adhesions. There was a constriction three-quarters of an inch from the cornu. The dilatation between the two constrictions was supposed to be due to tubercular endosalpingitis. When opened, however, it contained only a mucopurulent fluid with a granular condition of the mucosa but no tuberculosis. As this tube was closed at its proximal and distal ends, evidently ancient, there was no possibility of infecting it with tubercle bacilli except through the lymphatics or blood. The right ovary was normal and not disturbed. The uterus was free.

The mass described in the physical examination was found on the left side resting on the sigmoid and extending from a level with the pelvic brim down the left side of the pelvic wall to its floor. The mass was about two inches long by an inch and a quarter in thickness. The tube entered it above on a level with the fundus. Half way down, a coil of small intestine was organically united to it; the separation was accomplished with difficulty but without perforation. The fimbriated end of the tube was free and everted, with a tubercular ulcer a half inch in diameter on its surface. The ovary and the tube were carefully separated from the sigmoid and removed *en masse*. The tube was as large as an adult thumb and obliterated by a cicatrix at the base of the fimbriæ. The ovary was firmly adherent to the tube and could not be separated without lacerating the wall of the tubercular mass in the ovary. There was a communication between the ovarian abscess and the cheesy mass in the tube. The tuberculosis in the ovary involved a follicle and was the size of a walnut; the tuberculous wall was easily shelled out after the adhesions were removed. The remainder of the ovary was normal. The tube was the size of an adult thumb, and was filled with tubercular débris. The last and most ancient caseous mass was three-quarters of an inch from the cornu.

It seemed clear from the pathologic findings, that the tubal lesion was primary; that the wall of the tube ruptured into an adherent follicle, producing the nodule in the ovary. The peritoneum of the sigmoid was destroyed but there was no perforation found. The tubal stumps were buried beneath the broad ligaments on both sides and the abdomen closed.

The following is a report of the pathologic findings, from Dr. W. A. Evans:

"Referring to your specimen of tissue of Miss N. submitted to us on September 3, 1903, we wish to report as follows: The small peritoneal masses are tubercles. They are composed of epithelial cells and lymphocytes in about equal numbers. There are very few polymorphonuclear leucocytes. There is a distinct disposition to capsule formation around each nodule. A node, less than the size of a pea, is composed of many nodules. There are few giant cells and only a small amount of necrosis. There is an indistinct band of fibers underlying the tubercles. Some of the nodules are partially below this and some are wholly below it, but generally speaking they are above it. In the tissue below this band are the fibers underlying the tubercles. Between these bands of perpendicular fibers, are strings of cells that split them up. These

represent extension of the infection (tubercular) to the underlying tissue."

Further report on the same specimen: "Section 24560—1 is through a dilated portion of a Fallopian tube. Seen with the unaided eye, peritoneal tubercles appear. In addition there is a somewhat diffuse thickening of the peritoneum. The muscular tunic is not very prominent. The lining coats look necrotic.

"Under magnification: The peritoneum is diffusely thickened. Above the general peritoneal level, nodules rise here and there. In the peritoneum there are islands of large vesicular nucleated round cells. Generally these are in the perivascular spaces of the smaller bloodvessels. There are no giant cells. None of the cells show necrosis in the protoplasm. There is a slight leucocytic infiltration The perivascular spaces of the larger bloodvessels are not so affected. The same process, though to a lesser extent, is seen in the muscle tunic.

"In some places, near the muscle tunic, a few slightly dilated glands lined by low columnar or cubical epithelium can be demonstrated. These are usually partly filled with polymorphonuclear leucocytes. Nowhere else do we find any glands or epithelium. The tissue of this region is necrotic tubercular tissue with moderate leucocytic infiltration. There is little or no tendency to organization in this area. There is some evidence in these sections of infection travelling from the Fallopian tube mucosa to the peritoneum.

"24560—2 is through abscess. Our sections show a typical tubercle tissue, for example, such as is described under 24560—3. There are giant cells, productive connective tissue, inflammation, focal necrosis, etc.

"24560—3. This is a section through the ovarian abscess wall. Naked eye examination shows a Fallopian tube and its fimbriated extremity. The fimbriæ do not seem to be tubercular. There is no naked eye appearance of tubercle in the adjacent tube. There are a few small cysts similar to those that form in the tubes of Rosenmüller. Near the tube is an abscess wall. This seems to have an outer fibrous wall and a lining thrown into yellow folds or rows.

"Microscopic examination of the wall shows: Externally there is a banded wall with fibers that run circularly. These fibers are open in arrangement, but there are no islands or strands of cells to suggest that the infection was traversing the wall. External is a layer of tubercular granulation tissue. The yellow rows or ridges are due to piling up of this tissue. This tubercle tissue

shows a moderate number of giant cells. The ordinary cells are mostly fibroblasts in the spindle cell stage or even a little older than spindles. There are a moderate number of epithelioid cells. The proportion of reticulum is large. There is but little evidence of necrosis as a general proposition, though here and there are large necrotic islands. This is quite a vascular tubercle tissue.

"We find no tissue elements by which we can verify microscopically the nature of the lost tissue, *i.e.*, there are no specific ovarian elements."

SECTION VIII. TUBERCULOSIS OF THE PERITONEUM.

Frequency.—In 13,422 necropsies, the peritoneum was tuberculous in 284 (Grawitz, Brunn).

Age.—While the table collected by Osler shows that most cases occur between 20 and 30 years of age, it may be found at any period. During childhood it is somewhat frequent. Rotch found that in the Childrens' Hospital of Boston, the disease was extremely rare in the first few months, the youngest patient being 14 months old. After the first year and a half of life the disease was found to become frequent and was most common between the ages of two and four, after which it occurred occasionally only.

Sex.—The disease is more common in the female; according to Nothnagel, 90 per cent. of the reported cases are in females. In 322 cases reported by König and others, 251 were in women (78 per cent.), and only 71 in men (22 per cent.).

History.—A tuberculous family, or one of some antecedent lesion, is very noticeable. Thus, in Rotch's cases there was a tuberculous family history in 30 per cent. Other authors give a much higher percentage, for example, Brunn, 55 per cent.; Fuller, 60 per cent.; Desplans, 71 per cent.

Pathogeny and Etiology.—The cause is invariably from tubercle bacilli gaining access to the peritoneal cavity. The route, however, by which they reach the peritoneum is frequently difficult or impossible to determine and evidently is not the same for all cases. Dieulafoy believes the most frequent source is the intestine, where they have been introduced in sputum or food (infected milk or meat). The bacilli may attack the intestine first and the peritoneum next, or, absorbed by the superficial lymphatics of the intestinal mucosa, may attack the peritoneum primarily. This latter hypothesis seems to be confirmed by the experience of Wesner and Cornil. Again, Dobroklonsky has shown that the bacilli are ca-

pable of passing through the walls of the intestine without a primary lesion of the bowel and thus reaching the peritoneum without leaving any trace of trouble at the atrium of invasion, as it does in the pharynx, to infect the cervical glands.

Other sources are the blood current (which is more common in children, though infrequent at any age), the lymph current especially from the mesenteric glands, the pleura, the stump of the umbilical cord (Veit), and the genito-urinary tract. As a general rule, it may be stated that in males the most common source of infection is the intestine; next, the genito-urinary tract; and in females, the genital tract, especially the tubes. A number of cases of tuberculosis of the uterus and cervix have not extended to the tubes and vice versa, as Von Hauschka's cases.

Any previous condition which tends to weaken the resistance of the peritoneum will act as a predisposing cause, for example, acute peritonitis, pelvic hematocele, enteric fever, and especially the puerperium. Kelly believes the influence of pregnancy and parturition has not been sufficiently recognized.

From a pathologic standpoint, four varieties are manifest:

1. Disseminated, exudative, miliary, non-confluent, serous (ascitic) variety.

2. Nodular, ulcerative, or perforative variety; the least frequent variety.

3. Adhesive, fibro-plastic, cystic, partition or obliteration variety.

4. Suppurative, circumscribed or general mixed infection.

We have observed clinically the relation of tuberculosis of the tube and tuberculosis of the peritoneum. The tube has been almost uniformly involved in the tuberculous process where its fimbriated end was free from adhesions in a tuberculous peritoneum. So common was the condition, clinically, that I believed the tubes were infected from the peritoneum, and to demonstrate this route of infection, the experiments on the monkeys, reported above, were undertaken, with the results therein given.

Recently, I had a striking case of tuberculosis of the peritoneum, from a primary tuberculosis of the appendix, with multiple miliary deposits and few adhesions, a considerable quantity of fluid in the pelvis and non-adherent fimbriæ. The tubes were not enlarged and there was no tuberculosis of the tubal mucosa. This case also illustrates the similarity in the clinical history, between tuberculous peritonitis from a primary lesion of the appendix, and a primary disease of the tubes.

Mrs. N. J. M. Clare, Iowa. Æt. 27 years. Duration of illness, eight months and four days. Admitted to Mercy Hospital September 24, 1903.

Family History.—Mother died of carcinoma. One sister died of tuberculosis.

Previous History.—Only the diseases of childhood, with no recognizable sequelæ, except migraine, which she has had since childhood.

December 28, 1902, patient was suddenly attacked with pain in the abdomen, which was located at the umbilicus. It was intensely severe, requiring a hypodermic of morphine for relief. Four hours after onset patient was nauseated and vomited. The following day the pain gradually settled into the right iliac region. It was then accompanied by marked tenderness. The pain lasted for four days and gradually subsided. The right thigh was flexed on the abdomen and jarring of the bed produced pain. The severity of the symptoms gradually subsided but the sensitiveness to pressure in the lower half of the abdomen and particularly in the right iliac fossa has continued from that time. There was no temperature in this attack. (This is questionable.)

Second attack April 17, 1903. Similar to the first in every particular, except of longer duration.

Had a third attack June 26, 1903. The first attack was very severe and kept her in bed three days; the second, four days; and the third, nine days. From June 26 to the present time, the patient has been unable to do her housework; has felt languid; lost some in weight. There is constant soreness in the lower portion of the abdomen.

Menstruation began at 16; occurred about every 30 days; occasionally intervals would be shortened to 27 days and lasted from three to four days. This was not materially changed in the last year. There is no leucorrhea and never has been. Married three years; no pregnancies and no history of pelvic infection.

Present Condition.—Patient is poorly nourished; has a slight hectic flush on cheek; the abdomen is distended; no evidence of fluid; it is "doughy" in its response to pressure; in the lower half it is semi-resonant; in the region of the appendix a small induration can be detected. This is particularly sensitive.

Vaginal examination shows an infiltration of the Douglas pouch. Uterus is movable though not free. Tubes are not enlarged. The entire pelvic area is hypersensitive. No examination was made of the vaginal secretions either microscopic or inocula-

tion as the patient came to the hospital only 48 hours before operation. Urinary findings negative.

Diagnosis.—Recurrent and chronic appendicitis with chronic pelvic peritonitis.

Operation.—September 27, 1903. Section. Incision through the middle of the right rectus muscle. The peritoneum was chronically congested and very vascular. Soft cobweb adhesions united the intestines to the parietal peritoneum and to neighboring viscera. The caput coli was free; the appendix was as large as the adult index finger. At its base could be seen a small seropurulent accumulation of a couple of drachms. It was encapsulated by a thin transparent membrane, which ruptured on touching. The flocculi and mucoid material escaped. From this sac there was direct communication into the lumen of the appendix. The appendix, on the intestinal side of this opening was occluded by a granulation mass. A tubercular ulcer amputated the appendix for about two-thirds of its circumference. The pelvic peritoneum had the same web-like adhesions and friable fixation of all of the tissues. (These agglutinations are more like "slimy webs" than adhesions but the surface of the peritoneum has lost its gloss and is velvety in place of glistening.) The fimbriæ of both tubes were free and there was no enlargement or thickening of the tubes. The peritoneal covering of the tubes and ovaries was studded with miliary tubercles. No ulceration of the peritoneum and no organic adhesions in any position. The uterus was enlarged, but in normal situation. The appendix was removed from the wall of the caput coli. There was no thickening of the cecal mucosa. Tubes and ovaries allowed to remain. Abdomen closed.

The left iliac fossa was less involved than the right and the intestines had a smaller number of tubercles, as the distance from the caput coli increased. The jejunum had no tubercles; the omentum also was not involved. It is evident from the pathologic findings that there had been ruptures of the thin friable membrane, which encapsulated the tubercular débris at the base of the appendix, and that the repeated attacks of peritonitis were due to the escape of this material into the free peritoneal cavity. This also accounted for the hypersensitiveness and thickness of the pelvic peritoneum and, notwithstanding the severe infection of the pelvic peritoneum and the free fimbriated ends of the tubes neither the fimbriæ nor the tubes were infected by the tuberculous process; supporting the results of the experiments on the monkey, showing that if the tubes are infected at all from the peritoneum, there is

some additional condition necessary, other than tuberculous peritonitis with free fimbriæ.

Post-Operative Diagnosis.—Primary tuberculous appendicitis; perforation (repeated); tuberculous peritonitis. Convalescence uneventful.

Microscopic examination of the appendix revealed giant cells, epithelioid infiltration and tubercle bacilli; classic, tuberculous, perforative abscess of the appendix.

The experiments on the monkeys and this case show that tuberculosis can exist in the pelvic peritoneum without the tubes becoming tuberculous.

Symptoms and Diagnosis.—In the acute cases, there is marked pain in the pelvis and lower abdomen, radiating toward the lumbar region; diarrhea (or constipation); nausea and vomiting. The local examination is painful; the vagina is hot; the cul-de-sac is filled; there is a general doughy feeling, but no appreciable tumor; there is little or no disturbance of the menstrual function. The temperature is elevated. According to Galvani, of Athens, the fever is intermittent, especially elevated in the evening, with morning sweats.

In the chronic form on the contrary the temperature is frequently subnormal, 95.5° to 97° F. (Osler). Menstrual disturbances are very marked, pain is present at the menstrual epoch, the abdomen becomes enlarged and tender, especially on palpation over the iliac fossæ. As the disease progresses, the patients become pale, anemic and emaciated. The abdomen is very prominent, due partly to distension of the intestines with edema and thickening of its wall, and partly to accumulation of fluid. Bouilly remarks that the abdomen does not present the usual characteristics of ascites, flat in the middle and enlarged at the sides. Instead, it resembles an ovarian cyst, projecting in front and depressed at the sides hence erroneous diagnoses are very likely. Moreover, the quantity of fluid is not always the same, even the patients themselves notice variations in size. The same author points out an important fact, namely, that the quantity of fluid present is no indication of the extent of the disease. As much as ten, twelve, or even more liters may be found in cases where the tuberculous lesions are limited to the adnexæ and true pelvis.

Lohlein, giving an account of his experience at the Gynecologic Clinic at Giessen, states that cases with easily recognizable ascites are most commonly found in the medical wards. The majority of his cases were sent in by the family physician with a di-

agnosis of tumor or ovarian cyst. He adds that the ascites is detected by palpation and by percussion and will be found especially between the right and left hypogastric regions. In about one half of his cases, he found a distinctly flat sound from the median line to the left, even into the left iliac fossa. Toward the right however, the sound gradually became higher in pitch.

In cases also in which collections of fluid in the abdomen were walled off, the left side was distinctly duller than the right.

The explanation of this is found in the fact first pointed out by Thomayer that the diseased mesentery is drawn towards its root, hence pulling the bowels on the left to the median line and increasing the intestinal bulk on the right side, while the left side of the cavity becomes filled with the fluid exudate. (This explanation would not hold good in our cases as the mesentery was so rarely infiltrated.) Changes in the patient's position have little or no effect on the dulness.

Considerable information is afforded by rectal examination, and by the discovery of nodular masses and thickenings of the omentum.

Plaque-like thickenings of the deeper parts of the abdominal parietes are emphasized by Edebohls as a sign of the greatest value in the early diagnosis of peritoneal tuberculosis without ascites. "They impart to the examining fingers," he says, "the sensation as if the peritoneal surface were occupied by urticaria wheals of various sizes." He has met them varying in size from one to eight centimeters in diameter. They may be quite numerous or but two or three found scattered over the anterior and lateral walls. By examination during the course of the operation, this author is satisfied that these placques are due to hyperemia and swelling of the subperitoneal connective tissue. The peritoneum was frequently found unchanged and not the seat of tubercles at the site of the induration. Indeed, the sign may be especially well-marked in the very beginning of the disease, where only a few scattered tubercles are present. After the disease has progressed to universal and uniform thickening of the peritoneum, the sign will be less available. Edebohls therefore considers it of especial value in the very early stages and when it can be clearly distinguished in parts of the abdominal wall not overlying a solid viscus, he regards it as almost, if not quite, pathognomonic. The only other disease he continues, in which it might occur is disseminated secondary carcinosis. This, however, should present no difficulty,

as it could only occur toward the end of carcinosis, while in tuberculosis it is an early manifestation.

Edebohls believes enlargement of the spleen in connection with other symptoms is of some importance, as he found it in one half of his cases. He also noticed a deep brown discoloration of the entire integument which is alluded to by Osler also, who tells us that in his case the adrenals were not affected.

The symptoms and physical signs in tuberculosis of the peritoneum vary greatly in the three distinct types of the disease.

1. The disseminated, exudative, non-confluent, serous variety. In this variety with involvement of the tubes, the attacks resemble recurrent peritonitis of appendiceal origin, except the field of activity of the process is the pelvis and not the right iliac fossa; the attacks in this variety come with a pronounced periodicity and not necessarily associated with menstruation; they are due to the periodic discharge of tubercular material from the tubes as we demonstrated repeatedly in the operations during the attack. In this, the most common variety, the order of symptoms is, first, mild temperature; second, pain (principally in the pelvis) with nausea and vomiting; third, local tenderness over lower half of abdomen; fourth, great sensitiveness in the fornices; fifth, induration of the tubes; sixth, infiltration and thickening of the utero-rectal fold, by procteal examination (this is of special significance, though it is also present in pelvic peritonitis due to rupture of the appendix into the pelvic fossa); seventh, temperature on second or third day (from 101° to 103° F.); eighth, there is usually flatness in the lower portion of the abdomen and bulging of the cul-de-sac, due to the effusion, the quantity of which varies from a few ounces to many gallons; ninth, pronounced leucocytosis; in one the count was 18,400.

The peritoneum in these cases presents a congested surface, here and there gray fibrous placques, fresh deposits of miliary tubercles most numerous near the mouth of the tubes are seen and not infrequently fresh cheesy material is escaping or easily pressed out of the tuberculous tube. The attack is the peritoneal response or inflammation caused by the tubercular eruption or expulsion of débris from the tubes.

In each recurrence the symptoms appear in about the same order and continue the same period of time, eight to fourteen days. The remission is not complete as it is after an acute attack of appendicitis; there is continued hypersensitiveness of the pelvic peritoneum. The distinctly intermittent attacks do not occur in the

nodular, ulcerative or perforative varieties, in the adhesive fibroplastic nor in the mixed infection types. The "doughy" condition of the abdominal wall is not present in this variety; the abdomen has the same fixed resistance as in the other acute types of peritoneal infection. It requires considerable experience to make the differential diagnosis between this recurrent type of tubercular peritonitis and recurrent appendicitis, but when the patients are seen in the acute attack and the pictures are once clearly recognized there is less difficulty in making the differential diagnosis.

2. The nodular, ulcerative or perforative variety. This may be described in words thus: The whole force or destruction of the process is concentrated into small areas and in these areas not only the peritoneal coat but the deeper structures, as the intestinal wall, the mesentery, uterus or ovaries are destroyed or changed into caseous masses surrounded by dense connective tissue barriers and adhesions. The symptom-complex of this variety takes no definite form; the pains are irregular, there is no periodicity to the attacks, the fever usually does not exceed one or two degrees, there is a general malaise and occasional attacks of pain or cramps of an indefinite type; with local hypersensitiveness and nodules or bands of increased resistance. When the adhesions occlude the intestine or impair the transmission of its contents there may be recurrent attacks of colic which are not associated with temperature or manifestations of peritoneal inflammation. The circumscribed nodule, circumscribed sensitiveness or area of dulness are the only physical manifestations of the disease. The tubes are usually closed or fixed at their fimbriated ends to the neighboring viscera. The diagnosis in this class of cases cannot be made definitely except by exploratory section.

3. The adhesive, fibro-plastic, cystic, circumscribed abscess, partition or obliteration variety. This variety of tuberculous peritonitis manifests itself in the destruction of the endothelial lining of the peritoneum and the production of connective tissue products of varying degrees of density from the soft, spider-web or fuzz-like agglutination projections, a non-glistening, edematous, inflamed peritoneum, to the firm, white, fibrous inelastic, highly organized tissue which has even a greater resistance than the peritoneum itself. In this process circumscribed areas of the peritoneum retain their identity and react to the process in the production of a hypersecretion producing the circumscribed cysts which are so characteristic of this type of the disease. Occasionally these cysts receive infective flora most likely from the intestine and

produce circumscribed areas of suppuration. In this variety, too, we have the sealed ends of the tube or the fimbriated end communicating with a circumscribed cyst or pus accumulation. The intestinal wall and parietal peritoneum are usually very much thickened and inelastic, resembling wet leather. It is this pathologic change in the consistency and in the resistance of the intestinal wall and peritoneum that gives rise to the "doughy" response of the abdominal wall to external pressure. The adhesions may exist and obliterate the lower portion of the peritoneal cavity only, or the agglutination may extend and involve the entire peritoneum to the stomach so that no free peritoneal cavity remains. (Veit points out that the fact of adhesions being very numerous and extensive in healing tuberculosis makes it probable that this form succeeds the ascitic form; however, he adds, it is seen in patients who have never presented any evidences of ascites.) The symptomatic manifestations of this type of disease are those of a continued inflammatory process with a minimum septic intoxication, *i.e.*, the pain and hypersensitiveness of the peritoneum are continuous with exacerbations without an elevation of temperature above 101°, except when circumscribed mixed infection occurs; then the night sweats and evening elevation of temperature become conspicuous symptoms. The leucocytosis is never pronounced; the emaciation is progressive but not rapid. The physical signs are in consonance with the varied pathologic changes in the peritoneum above mentioned. In the cobweb variety we have slight vaulting of the abdominal wall, uniform decrease in the resonance of the percussion note, an absence of borborygmus and the classic "doughy" elasticity of the wall to pressure. The uterus is somewhat fixed; the fornices increased in resistance, but not infiltrated; the recto-uterine peritoneal fold is very sensitive to pressure and the tubes are occasionally palpable as irregular nodular ropes.

In the circumscribed, cystic form the quantity of fluid in the cyst or cysts may represent but a few ounces and rarely exceeds a pint. They are usually fixed and are frequently mistaken, when deep in the pelvis, for cysts in the broad ligament. They are often irregular in outline and occasionally involve a segment or even half of the abdominal cavity with a marked ridge or partition of adhesion extending obliquely or transversely across the peritoneal cavity.

The fluid does not change (position) its location with change of the body's position. The inflammatory reflex manifestations and mode of onset are not so pronounced as with torsion of the pedicle of an ovarian cyst. The clinical course, however, resembles

that of combined tubal infection and ovarian cyst with pericystic inflammation. In the latter pathogenesis we frequently have multiple inflammatory cysts resembling closely those of the tubercular variety, but the pathologic change in the peritoneum differs materially.

4. Tubercular peritonitis with mixed infection. While we class this as a separate variety, in reality it is any of the three preceding pathologic conditions to which the additional influence and effect of other infective flora have been added, and in which the virulence of infection plays a very important rôle both in the pathologic changes and symptomatic manifestations. When secondary mixed infection takes place, the tendency at once is to circumscription of the process. If at the time of secondary infection the tubes only are involved, the fimbriated ends immediately become closed or fixed to a neighboring structure or terminate in a circumscribed abscess. I have never seen a case of mixed infection of the tube with free fimbriated extremity, and only in very exceptional cases of the sero-exudative type have I found the end of the tube closed. So uniform is this condition that I consider that when the fimbriated end of the tube is sealed there is or has been a mixed infection. Occasionally we find a mixed infection in one tube, with its end closed, while the other tube has a simple tuberculosis with an ectropion of the mucosa and a free fimbriated end. In tuberculous mixed infection of the tube and small circumscribed abscess, we have exacerbations of the inflammatory process mimicking the exacerbations of specific pyosalpinx; the former has a more pronounced periodicity in manifestation and there is less inflammatory reaction of the peritoneum. The physical findings are practically the same. When a large tuberculous effusion or cyst receives a mixed infection and the lower half of the abdomen becomes similarly involved, we have an empyema of the peritoneum with a distinct partition. In one case of this kind, the intestines were all displaced by a pathologic diaphragm that had formed on a level with the umbilicus and when opened was an enormous pyoperitoneum without intestines as illustrated by the case of Mrs. L. (see below). If the type of infection be virulent these suppurations are associated with chills, pronounced elevation of temperature, hectic diarrhea and rapid emaciation. The leucocytosis is not so marked as in the average acute peritonitis. The anamnesis and the physical and clinical manifestations before the inception of the mixed infection are of great value in making the differential diagnosis between this and other varieties of peritonitis.

There is occasionally a necrosis of the wall of the abscess and the contents are emptied into the intestine, bladder, vagina, ureter or upon the surface of the body. This adds materially to the gravity and the danger to the life of the patient. The mixed infection variety requires special consideration in its surgical management.

Mrs. L. Æt. 22. Admitted to Mercy Hospital July 6, 1896.

Family History.—Negative.

Personal History.—Has been married one year. As a girl, weighed 140 pounds. One year ago had a slight attack of pleurisy. Does not know that there was effusion in the chest. No cough preceding nor following it.

About four months ago patient began to complain of lassitude and anorexia, with enlargement of the abdomen. There was no nausea, nor vomiting. Shortly after the appearance of the enlargement, she began to have fever, with profuse sweatings; appetite became less and less; she had decided afternoon hectic. Case was pronounced typhoid fever.

When patient entered the hospital temperature was 102, pulse 136. Complains of dyspnea and pain through abdomen. This pain has been present to a mild degree for four weeks. Is relieved somewhat by bowel movements. Lungs negative.

Physical Examination reveals a flatness over the lower abdomen, from a level with the umbilicus. Fluid does not change with change in position.

Pelvic Examination reveals thickening and fixation of the Douglas pouch; impaired mobility of the uterus; hypersensitiveness of the recto-uterine peritoneal fold; nodules in both fornices. The masses could not be outlined by bimanual palpation on account of fluid in the abdomen.

Operation.—July 7. Median incision. An enormous pyoperitoneum, filling the entire lower half of the abdomen to a level with the umbilicus. No intestines were to be seen in this field. The omentum was covered with thick fibrinous exudate, making a distinct diaphragm, walling off the upper from the lower portion. The tubes were buried in a mass of adhesions. The fimbriated ends were closed. Both were removed. The cavity was mopped out and iodoform gauze and tube drain inserted. Tube and gauze were removed on fourth day.

After the operation, the temperature dropped to 99° and remained there for three days, and the pulse to 110. Then, gradually, the pulse and temperature began to rise and each evening

the temperature reached 102 until the eleventh day, when it reached 103. The pulse gradually increased in frequency to 110-120. Patient left the hospital July 26, with the wound discharging, the hectic, anorexia, night sweats, and emaciation continuing. The temperature increased to 104 and I learned that the patient died a few weeks after leaving the hospital.

I believe in this case, where the disease was so thoroughly circumscribed to the peritoneum, that if I had followed the plan of the present time, namely, emptying and reclosing the abdomen, that the temperature would have remained down, as it did for the first three days, and that the patient would have progressed to recovery. It was the secondary mixed infection, the result of the drainage, which I believe hastened the final unfavorable result.

Prognosis may be appropriately introduced with some quotations from the earlier writers:

Wunderlich (1856) did not observe a cure.

Bamberger (1864), who divided peritonitis into two classes (1) peritonitis from tuberculosis and (2) that from the female genitalia, says even when the local process is healed, death ultimately occurs from tuberculosis of other organs.

Bauer (1875) considered the condition absolutely fatal.

Jurgensen (1888) says recovery is rare and relative only.

Eichhorst (1891) believed the prognosis very bad. In his opinion recovery is infrequent and even then is only relative and uncertain.

Strümpell (1892) believed the disease could progress to a fatal termination in a few weeks or months. Occasionally there is a pronounced remission of symptoms even to apparent cure. As a matter of fact, the disease reappears as an acute tuberculosis of other organs.

This type of remission was forcefully illustrated in the following case:

Miss H., æt. 16, seen in consultation April 9, 1901, suffering from a severe acute attack of tuberculous peritonitis, with considerable abdominal effusion, local nodules of excessive resistance and tenderness. Infiltration and thickening of the pelvic peritoneum shown by procteal examination; morning temperature 101°, evening 103°; sweats and hectic; great depression. These symptoms had been present with increasing severity for ten days. Operation was advised and declined. During the three weeks following the patient made great improvement, the vomiting ceased, the pain, temperature and effusion disappeared; patient's general ap-

pearance was materially improved and the surgeon was severely criticised for suggesting the operation. Five weeks from the onset of the attack the patient began to complain of severe headache, nausea, and the temperature suddenly rose to 104°. In twelve hours she was delirious and in seventeen unconscious. She remained in that state until she died at the end of the third day, with all of the manifestations of a tuberculous meningitis with effusion.

Vierordt (1894) reported a case of spontaneous cure as a curiosity.

Henoch (1897) says medical treatment is useless and was not very sanguine as to operation.

Pribram (1898) mentions some spontaneous cures.

Kussmaul (1899) witnessed complete recovery in a case with enormous ascites and several recoveries in cases of milder type.

In considering prognosis the possibility of spontaneous cure must be taken into account,—a cure so complete that not the least vestige of the original disease may be left. Several such are now recorded, Alterthum alone mentioning three. Veit looks upon cases of peritonitis with ascites and granular dissemination over the peritoneum as undergoing healing. Gatti, in his experiments on animals found that the fibrous form of tuberculosis healed readily, while the caseous form never healed. As a general proposition it may be stated that the more acute the case, the better the prognosis. The prognosis is materially influenced by the modern methods of aggressive surgery to which attention will now be directed.

TREATMENT.

The surgical or medical treatment of tuberculosis of the peritoneum involves four propositions: First, to remove or shut off the source of supply to the peritoneum of new tubercular débris; second, to remove the products of the infective process from the peritoneum; third, to increase the tissue proliferation for the encapsulation of the foci already present; and, fourth, to avoid mixed infection. All treatments that have availed, as recorded in the history of the therapeutics of this disease, have succeeded on these lines, as may readily be seen from the following abstracts:

Logically, says Gorovitz, treatment should fill two indications: (1) Cure the peritoneal lesion, and (2) above all, suppress the tubal lesion, which was its starting point. The operative treatment dates back to 1862, when Spencer Wells made a laparatomy in a case of tuberculous peritonitis, and found, to his great astonish-

ment, that his patient not only survived the operation but was cured. Laparatomy was formally advised as a therapeutic measure by König in 1884. Five years later, in 1889, this author was able to collect 131 cases from his own practice and from the literature. After a study of these, he announced that the most frequent method was a simple abdominal incision with or without evacuation of the fluid.

The operation itself, as regards technic and dangers, is the same as a simple exploratory incision, according to Schwartz. It is done in three stages—opening the abdomen, under the most rigid asepsis, evacuation of the ascitic fluid and closure of the wound. The application of antiseptics—iodoform, etc., is of no additional benefit, and the majority of operators advise tubular rather than gauze drainage. Care is necessary in incising the abdominal wall as the peritoneum is approached, on account of the possibility of wounding the intestines which may be adherent to the wall.

The tendency of surgeons at present is to operate later and later, after the pain and discomfort from the ascites and adhesions have become so marked that relief is imperative. Too early intervention is unwise since the tuberculous process may be still in process of evolution.

The operation by the vagina, advocated by Condamin and Lohlein and his pupils, is not in favor at present. The advantages claimed for it are: (1) The dangers of infection are reduced to the minimum; (2) there is no liability of a ventral hernia; (3) shock is lessened, owing to there being less occasion for handling the bowels; and, (4) recovery is quicker; but the statistics of Lohlein support the abdominal route with 64.7 per cent. recoveries against 57.1 per cent. recoveries by the vaginal route. Baumgart, one of Lohlein's assistants, gives some figures, which, while not extensive enough to afford any conclusive evidence, show there is but little difference between the abdominal and vaginal routes. Thus, of twenty-four laparatomies, eleven healed (64.7 per cent.); of seven vaginal operations, four healed (57.1 per cent.).

Healing has also occurred after simple puncture; and after evacuation of the fluid and injection of air, advocated by Mosetig-Moorhof. Koster has had excellent results in tuberculosis of the anterior chamber of the eye by the puncture method. In one of Baumgart's cases, though, puncture was tried twice unsuccessfully; on one occasion 4,000 cubic centimeters were evacuated, and 6,400 on another. Laparatomy was finally performed on account of recurrence and the patient was well five years afterward.

A second laparatomy may be called for and in one case (that of D'Urso) no less than four were performed before healing eventuated.

To what is the beneficial effect of the operation to be attributed? There are several theories; the latest ones, and those in accord with the present knowledge of bacteriology are as follows:

Gatti believes the cure is due to a post-operative serous effusion and "aqueous degeneration, so to speak, which has a bactericidal effect, dissolving the epithelioid cells and reviving the lymphocytes.

Hildebrandt's opinion is very similar; he considers the cure to be caused by a marked post-operative hyperemia.

Nannotti and Bacchiocci from their experimental work also conclude healing arises from the inflammatory reaction of the peritoneum with increase in the resorptive powers of the serosa and consequent fibrous degeneration of the tubercles.

Von Winckel claims the laparatomy heals by evacuating a toxic principle.

Veit amends this by adding that it has a still more important effect—to determine the arrival of a new quantity of antitoxin. If, he says, we evacuate the effused fluid suddenly and completely a new effusion of normal serum occurs immediately, which is possessed of bactericidal power in the highest degree. Hence the struggle against the microbes will have the best chance of succeeding. If, however, fresh bacilli continue to penetrate into the peritoneum, or a tuberculous focus elsewhere in the body partly neutralizes this antitoxic power of the serum, it is evident healing will not result.

To the objection that the antitoxin serum should annihilate the bacilli in all tuberculous foci, Veit makes the following answer: The presence of bacteria in the tissues produces an antitoxin in the serum which acts on all bacteria that enter the body after its production. Those bacteria, however, which were the cause of its production are not affected; they are either protected by their toxins or are surrounded by a neutral zone, through which the antitoxin cannot act. Failures to cure in the early stages by a premature operation are due, says Veit, to the fact that the serum has not acquired sufficient antitoxic power. These considerations of Veit are corroborated by Arcangeli, who found that the older the fluid, the more pronounced its antitoxic power.

We now come to the question of vital importance—In what pro-

portion of cases of tuberculous peritonitis may we expect a cure after operation?

As it might be expected, from the authors quoted in the section on prognosis, some observers prefer medicinal treatment. Hildebrandt, for example, claims that laparatomy only encourages the tendency of the tubercles to heal but is incapable of causing this by itself. The advocates of medicinal measures advise early systemic treatment as soon as the diagnosis is established and rely on the usual anti-tuberculous remedies—rest, exhibition of creosote, iodin, and the like.

The most recent advocate of conservative treatment is Borchgrevink, who gives us his experience in two almost equal series of cases, one with laparatomy, the other without. Of twenty-two cases operated on, fourteen (63.6 per cent.) recovered, and eight died. Of seventeen cases treated conservatively, fourteen recovered (82.3 per cent.). As a result of his observations, Borchgrevink concludes that though the operation may have done good, it was doubtful, to say the least.

Against these conservative opinions is the overwhelming evidence of numerous operators, and the value of operative intervention can no longer be said to be in question. A distinction must be made however, between anatomic healing and clinical healing. The former is possible but apparently unusual. As regards clinical healing, it is evidently unfair to report "cures" a few weeks or months after the operation. As in carcinoma, a time limit must be set and Von Winckel sets this at five years, which is evidently too long a period.

A number of collections of statistics have been published, showing the beneficial effects of the operation; among these may be cited:

Margarucci; 250 laparotomies in Italy, with 85 per cent. recoveries.

Von Krencki; 226 laparotomies. Of the ascitic cases, 71.5 per cent. recovered; of the adhesive, 61.6 per cent., and of the encysted, 75 per cent.

Thomas; 346 laparotomies. Of the ascitic variety, 73 per cent. recovered; of the encysted, 57 per cent., and of the dry adhesive, 57 per cent. likewise.

Roersch; 358 laparotomies with 70 per cent. of recoveries.

Adossides; 405 laparotomies with 75 per cent. of recoveries.

Hall, Dr. Rufus B. (Cincinnati), reports 110 sections for tuberculosis of the peritoneum; four were in the male; all from

tuberculosis of the appendix; 106 on females, 8 due to tuberculosis of the appendix and 98 to other causes. Of these, 94 are symptomatically well; one died the third day following the operation; six died of tuberculosis in from 14 months to three years after the operation; one died three and one-half years after the operation and another, four and a half years after. Two cases have now advanced pulmonary tuberculosis and will probably die. These are striking results in favor of operative treatment.

The figures from the Königsberg Klinik give 58.8 per cent. of recoveries, and Frank, from observations at the Heidelberg Klinik, places the percentage of recoveries at from 40 to 50.

While a rapid recurrence of the ascites is an unfavorable prognostic omen, a second laparatomy has been done in over 70 cases, and in one, as stated before, four times.

In this connection, Sippel's case is both interesting and instructive. At a laparatomy, the abdominal end of the tube and the peritoneum were found to be studded with tubercles. Healing apparently resulted, yet seven months later pain reappeared on the left side and a second laparatomy disclosed the same condition of affairs on this side, the first focus, on the right side, having healed completely.

Treatment of Tubercular Peritonitis.

From the comments by the various writers, it is clearly recognized that there is a wide divergence of opinion as to the results obtained by medical and surgical intervention and by varieties of these. This difference of opinion, evidently based upon results of accurate observations and founded on facts, is due to the lack of classification or recognition of the different pathologic processes that have taken place or are taking place in the peritoneum. A few of the writers have based the statistics of their results on clearly classified pathologic conditions of the peritoneum, and these statistics are of the greatest value. No general surgeon would expect a restoration of the knee-joint, *ad integram,* where the cartilage and synovial membrane had been destroyed, no matter whether the treatment was a local application, a dose of creosote, a powdering with iodoform, an exposure to air or to the X-ray. And still, with exactly the same degree of destruction of the peritoneum, patients are expected to recover by any of the varieties of treatment mentioned.

In discussing the proposition of prognosis or results by any type of treatment, a distinct classification of the pathologic con-

ditions must be mentioned, if the author's opinion or statistics are to carry weight. The treatments must be varied to meet indications for overcoming the pathologic conditions in the individual case. In expressing ourselves on the subject of treatment, we shall endeavor to keep clearly in mind the four prime and typical pathologic conditions described above, notwithstanding we recognize that these often merge and the treatment must be adapted to the predominating pathologic phenomenon.

Treatment of the Disseminated, Serous Variety.

Treatment of disseminated, miliary, exudative, non-confluent, serous peritonitis, which in the great majority of cases is associated with or due to tuberculosis of the tube. The fimbriated end of the tube is open; it is constantly ejecting into the peritoneum the tubercular débris and adding additional insult to the peritoneal surface. The medical treatment of this class gives poor results, as in thousands of laparatomies it is the rarest exception to find a healed tuberculosis of the peritoneum where a mixed infection and closure of the tube has not occurred. Furthermore, it is a well-recognized pathologic fact that tuberculosis of the mucous surface of the tube, like tuberculosis of the mucous surface of the intestine has little tendency to heal or encapsulate, and without the healing of the mucous membrane of the tube there is no cure of the peritoneal disease as long as the fimbriated end remains patulous. Abdominal section *per se* without the removal of the tubes and without the induction of an inflammatory process, which would produce the occlusion of the tubes, would be as futile and useless as internal medication, or creosote. The prime indication in this class of cases is to remove the diseased tubes on the uterine side of its primary caseous nodule, which is usually about five-eighths of an inch from the uterine cornu. When this is accomplished and the abdomen closed, if there be no pus infection, the case will recover whether it be drained, iodoformed, solarized or simply closed up without any of the so-called life-saving touches. I am convinced, from the observation of the process of repair of tuberculosis, not alone in the peritoneum, that it is important to have an inflammatory reaction following laparatomy if the case is to make a rapid and satisfactory recovery. This post-section reaction I believe is due to a fermentation or decomposition of the fluid or secretion remaining within the abdomen. This does not, to my mind, produce an antitoxin which destroys the bacilli, but it causes what

the iodoform-formalin emulsion injection into the knee-joint causes—a chemical irritation and inflammatory reaction in the tissue. If the peritoneum be inspected three or four days after the laparatomy, as I have had opportunity to do on more than one occasion, it will be found intensely congested, its vascularity greatly increased, its gloss almost or quite abolished, and the fluid not fresh, clear serum, but cloudy or sero-purulent, showing the most active proliferation. It is this tissue proliferation which overwhelms and encapsulates the tubercular foci on the surface of the peritoneum. Fluids removed at this stage showed equal or greater toxicity than fluids removed preceding the operation, but the resistance of the tissue as manifested in the so-called inflammatory reaction was increased sufficiently to overcome the destructive effect of the micro-organisms, *i. e.*, the inflammation is not the disease, but the manifestation of resistance offered by the tissues to the invading pathogenic flora. The phenomena of inflammation are the outward manifestations of tissue resistance, are life-saving, should be encouraged, except when the local leucocytosis, edema and proliferation is such as to strangle or occlude the circulation. Celiotomy attains its best results in this class of cases. If the focus of supply to the peritoneum be a mesenteric gland, a peri-appendiceal tuberculosis, the removal of the focus is indicated the same as a removal of a tube. Should the communication between the peritoneum and the focus be destroyed, then the laparotomy will produce a cure of the peritoneal conditions the same as if the focus is removed. But with the source of supply cut off, the tendency to repair of the peritoneum is great, even without laparatomy, and in this class of cases internal medication or expectant treatment avails. When there is a tuberculosis of the intestine and the peritoneum is involved without extensive adhesions, the indication is to remove the tuberculous intestine, unless the area be too great. If its removal be impracticable, the infected area should be excluded from the fecal current by short-circuiting the intestine. The tuberculous process in the excluded portion ceases to advance and often heals. The patient's life can be prolonged, and he can also be relieved of most of the disagreeable symptoms of the tuberculosis. Resection of the bowel for tuberculosis in the presence of a peritoneal tuberculosis is a very hazardous and usually futile undertaking, as an intestinal fistula is often produced when the patient survives the operation.

Treatment of the Nodular, Ulcerative and Perforative Varieties.

In these varieties, based on the clinical history and physical findings as well as the biopsies, the changes, in a large proportion of the cases, are as follows: First, a more or less diffuse tuberculous peritonitis, usually of tubal origin, but due to enteric and glandular infection more frequently than the previous variety; second, the healing of the peritoneum except in circumscribed areas, as at the ends of the tubes, between firmly agglutinated intestinal coils and between the omentum and parietes. In these circumstances the tuberculous process destroys the peritoneum and occasionally the intestinal wall, tube, etc., and produces a considerable sized caseous mass. These masses are usually surrounded by firm connective tissue barriers, and unless they occlude the lumen of the bowel or perforate one of the hollow viscera, they give the patient very little inconvenience. There is commonly a considerable quantity of fluid in the peritoneal cavity, but the exacerbations and recurrences of the peritonitis are less frequent and mild, so that they are many times overlooked and the peritonitis is not even suspected until, on physical examination to ascertain the cause of the emaciation, night sweats, etc., the tubercular nodules are recognized in the abdomen. If the nodules are few and the peritoneum practically free from adhesions, good results are obtained by operative procedure. The tubes, in these cases, should be removed, if it can be accomplished without lacerating the intestinal wall. The circumscribed accumulation of tubercular material should not be disturbed and the greatest care should be exercised not to injure the intestinal wall or hazard its integrity, and so produce an intestinal fistula. If the tuberculosis is confined to a few adjacent coils of the intestine and the remaining portion of the peritoneum free from adhesions, the coil should be resected; otherwise, the infected area should be excluded and allowed to remain. Should there be entero-intestinal fistula, as is common in this variety unless the peritoneum is comparatively free from tuberculosis, the resection should not be made, as failure of union is not uncommon, and intestinal fistula results. It is in this class of cases that the intestine is often incised in opening the abdominal wall. It is here also that the limitations of surgical intervention should be kept clearly in mind, and when the greatest discretion should be exercised in the separation of adhesions, having in mind that these adhesions are Nature's coffer-dams and are

often life-saving. It is questionable whether surgery gives better results than internal medication in this class of cases. It does clear up the diagnosis, and, with proper discretion, adds nothing to the danger.

Treatment of the Adhesive Variety.

This classification of cases occurring as adhesive, fibro-plastic, cystic, partition and obliteration of cavity is explanatory of the pathologic changes. It signifies, first, that the process is severe in that it destroys at least the epithelial layer of the peritoneum; and, second, that the membrane has finally reacted to the production of firm encapsulating and reparative cicatrization. In the milder types of this variety, the entire surface of the peritoneum or circumscribed areas is gummed together with a web-like, mucilaginous substance which is easily separated, and when separated does not leave an abraded or oozing surface. If the process has been more destructive, the union is organized connective tissue and when separated leaves a bleeding, denuded surface; indeed, if the walls of the viscera do not tear in the efforts at separating adhesions, so extensive may this process be that the peritoneal cavity, as such, is obliterated. Surgery is of no avail in this class, and the intestine is in great danger of injury in opening the abdomen. Circumscribed cysts form between the intestinal coils and in the pelvis generally; they are usually small, holding but a few ounces; occasionally they contain quarts and are surrounded by agglutinated intestine and parietal peritoneum. These are to be opened and not drained; the walls cannot be removed, and their removal should not be attempted. The surface should be dusted with iodoform or sponged with a 1:1000 formalin solution, remembering that this sac is not peritoneum as a rule, but a cyst wall of inflammatory origin. These cavities should never be drained, as they are easily infected, and once infected, they continue as suppurating sinuses for months, often associated with pronounced symptoms of septic absorption, taking on the characters and dangers of the pathologic varieties to be described under the fourth classification.

These circumscribed cysts are often mistaken for ovarian or broad ligament cysts, and when efforts are made to remove the cyst walls the result is baneful to the patient and humiliating to the operator. The greatest care should be taken not to infect

them when operating and the abdomen should be securely closed. After evacuation and irritation, the cavity is obliterated by adhesive inflammation.

Treatment of Mixed Infection, Circumscribed Abscess, and General Suppuration.

Pus infection may occur with any of the preceding varieties, or it may be one of mixed infection from the primary focus of tuberculosis and extension from there to the peritoneum. When the primary focus is a mixed infection, the abscess is always small and its extension is by ulceration, coagulation, necrosis and other than extension along the surface, or through the lymphatics. If the primary focus is the tube and this is of the mixed infection variety, the end of the tube becomes sealed and a pyo-tuberculous salpingitis is established. The extension may be an ulceration through the fimbriated end and the formation of a circumscribed abscess in the cul-de-sac, ovary, or wherever the fimbriated end is adherent. The extensions from the mixed-infection salpingitis are usually by ulceration through its wall to the neighboring tissues; if the tube be adherent to the ovary, a tubercular abscess in one of the Graafian follicles to which it is attached is formed as shown in case of Miss N, reported above. If it adheres to the intestines, it may perforate its wall to a tubo-intestinal-sinus result.

This is one of the conditions to be apprehended in operating for tuberculosis of the tubes and peritoneum, and is one of the most dangerous, as fistulæ of the intestine of tubercular origin are difficult to suture on account of the infiltration of their margin and neighborhood. Resection is next to impossible, on account of the extensive adhesions; also the peritoneum, which is of such great importance in all types of intestinal approximation, has been destroyed by the tubercular process, and therefore no primary peritoneal adhesions form to support the walls. In repairing these openings, extensive surface approximation should be secured and a number of rows of sutures inserted, that apposition may be insured during the process of tissue regeneration.

When the perforation is in the first portion of the rectum, and that viscus fixed, I have, in two separate cases, successfully sutured the fundus of the uterus into the opening and secured a primary closure.

As agglutination and union of tissue is slow under these circumstances, intra-intestinal pressure should be reduced to a minimum by the use of a permanent rectal tube; or, if the opening be larger, a temporary colostomy should be performed until the perforation is closed. The large pus and tubercular accumulations in the peritoneal cavity are, as a rule, due to formation of circumscribed tubercular cysts, and these cysts have a secondary pus infection, producing the large mixed-infection tubercular abscess. These may range from the size of a walnut to an accumulation occupying the lower half of the peritoneal cavity. In one of my cases, there were no intestines except the descending colon and rectum below the umbilicus, a firm diaphragm of adhesions having formed across the abdomen at the umbilical level. The peritoneum above this diaphragm was free from tuberculosis; below the diaphragm was one large empyema of the peritoneum. After opening and draining, this wall was so dense and firm that there was very little contraction, and the patient succumbed to the toxemia of the mixed infection. The case should have been closed after the exploration and repeatedly aspirated and injected with a solution of glycerine 88 per cent., iodoform 10 per cent., formalin 2 per cent. In the more acute and virulent mixed infections, where a general tuberculous peritonitis has preceded, the intestines and omentum and abdominal wall become adherent in all varieties of ways, so that innumerable, circumscribed, noncommunicating, suppurating pockets fill the abdominal cavity. These cases are practically hopeless; one, two, ten or innumerable abscesses may be overlooked; following the operative separation of the adhesions there is additional absorption, and the patient's life is rather shortened than prolonged by the operative intervention. Cases of this class can often be diagnosticated without section, as they present nodular, fluctuating or semi-fluctuating masses in the abdomen without assuming the general shape of the cystic neoplasms resulting from the ovary, kidney or omentum. Here, exploratory puncture with a very fine needle is advisable and is one of the rare exceptions to the general rule against exploratory punctures of intra-abdominal enlargements.

In the mildest types of mixed infection the general peritoneal cavity is filled with a seropurulent effusion without limiting adhesions and without the destruction of the peritoneal endothelium. These cases are as favorable for evacuation and primary closure as the purely serous variety. They should never be drained, and

if the cavity refills it should be aspirated. The greatest caution in instrumentation and sponging should be taken, lest a more virulent inoculation be established in the susceptible culture medium.

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MOVABLE KIDNEY WITH SECONDARY CYST FORMATION, RESEMBLING OVARIAN CYST.

By RUFUS B. HALL, M.D.,
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In the cases reported in this paper the cysts had become so large that they filled the entire abdomen and pelvis and were regarded by the family physicians of the patients as ovarian tumors. When the patients came to the writer the appearance of the abdomen and the physical signs were exactly those of patients suffering from ovarian cysts of large size, yet upon investigation they proved to be kidneys that had been movable and later had become cystic.

The subject of movable kidney is always one of keen interest to men engaged in surgical work. Until recent years the almost universal opinion in the profession was that a movable kidney was not dangerous to the life of the patient, and that this condition did not call for operative treatment until the patient suffered extreme pain or developed pyonephrosis. The present practice is not to interfere until compelled to do so by torsion of the pedicle, or some serious pathological lesion. While it may be conceded that only a small percentage of patients suffering from movable kidney have obstruction of the ureter, necessitating an operation for relief, quite a large proportion develop hydro- or pyonephrosis, and in a few more or less complete obstruction occurs.

Many of these cases suffer more or less discomfort in the region of the misplaced kidney. The pain, which is of a dragging, burning character, is not severe enough to necessitate an anodyne, yet is a source of great discomfort and annoyance. Some of these patients have pain all the time while they are in the standing position. Quite a large percentage of them are relieved immediately upon lying down. In these cases an operation for fixation of the kidney is of great benefit.

We have pointed out some of the leading symptoms of a movable kidney which are usually considered by the profession at

large as not of sufficient importance to call for surgical relief. In the opinion of the writer a large percentage of these patients should be operated upon early, before they develop hydronephrosis. In all cases of movable kidney, with recurring attacks of hydronephrosis, the notable symptoms are scanty urine and an enlarged kidney caused by curvature or temporary twist of the ureter. They suffer acute abdominal pain which calls for anodynes for temporary relief. The gradually increasing curvature and obstruction of the ureter has a very marked effect upon the secretory power of the kidney, diminishing the secretion as the obstruction progresses until in extreme cases atrophy or cystic degeneration of the kidney may be the result.

In the cases of movable kidney coming under the writer's observation there have been recurrent attacks of hydronephrosis in the majority of instances. In studying the history of these cases we find that when the urine is unable to escape, it distends the pelvis and calices, causing destruction of the tubules and Malpighian tufts, and terminates in a cyst the walls of which are composed of the pelvis and the capsule of the kidney. This process requires many years before a tumor of large size is developed. If the patient is permitted to suffer and the condition is not corrected by operation, inflammation is likely to occur as the result of the obstruction. As the result of this we have a large hydro- or pyonephrosis in place of the simple recurrent hydronephrosis.

The writer has observed several cases of temporary hydronephrosis with severe attacks of pain and a tumor as large as a cocoanut in which, after replacement of the kidney, the tumor would be suddenly reduced in size and there would be immediate relief from pain without the use of morphine. In all of these patients suffering from hydronephrosis with periodical attacks of pain, necessitating morphine for relief, examination of the urine will reveal more or less pus present. In three or four days after the attack has subsided the pus almost entirely disappears from the urine. Thus an examination of the urine between the attacks is often misleading. These are the cases in which an operation promises great relief. With our present perfected technique the operation is almost devoid of danger. If it is performed before serious pathological changes occur in the kidney relief is immediate and permanent.

The writer believes that the cases he reports were originally cases of simple movable kidney with recurrent hydronephrosis.

As the disease progressed complete obstruction of the ureter occurred, with pyonephrosis. He has little doubt that if the patients had been subjected early to an operation for fixation of the kidney, that organ could have been saved and the long, tedious illness, with the severe operation at the end, could have been avoided.

CASE I.—Mrs. S. M., æt. 47, of Bellville, Ohio, was referred by Dr. Stofer (who had recently been called in the case). She was married at the age of 21 and is the mother of eight children, the youngest nine months old. The tumor was first observed after the birth of her first child who is now twenty-five years old. At that time it was in the upper right half of the abdomen and appeared to be about the size of a small cocoanut. The tumor remained about the same size and caused but little discomfort until her fifth pregnancy. During this gestation the tumor increased in size until it was as large or even larger than the uterus at full term. After the birth of this child (in November, 1891) the tumor increased in size very rapidly and the patient was very ill. During this illness, two weeks after delivery, the tumor was tapped for the first time and six gallons of straw-colored fluid were removed. After the tapping the patient's health improved rapidly and in about three weeks she was able to resume her ordinary household duties. The tumor soon appeared again. It gradually refilled and the tapping was repeated once or twice each year afterwards. At each tapping three or four gallons of fluid were removed.

One interesting feature in connection with the history of the case is that she bore three healthy children after the tumor was first tapped. It was always necessary to tap the tumor within two or three weeks after each delivery as it rapidly became so large that she demanded relief. Each time after the tumor was tapped she had several months of comparatively good health. There was no accident following the tapping until in April, 1899. After about three gallons of fluid had been withdrawn there was severe hemorrhage into the tumor, the blood flowing through the trocar, and the patient went into collapse. She recovered promptly from this and bore one child afterwards. She was tapped two weeks after the birth of her last child but developed fever immediately afterwards. This fever never entirely subsided until after the tumor was removed. She was obliged to wean the child on account of her illness. The tumor did not increase in size as rapidly as on previous occasions but the abdomen was always

exceedingly sensitive to pressure during this illness. The patient became anemic, lost flesh rapidly and had night sweats.

When she came under my observation, September 2, 1901, her pulse was 130, her temperature 100 to 101, her weight 90 pounds, and she was profoundly septic. Her former physician had always regarded the tumor as ovarian and had frequently advised an operation for its removal, but as the patient had learned that she could be made comfortable by tapping, with scarcely any pain, she had refused an operation until the present time when she and her family became convinced that she would soon die if the tumor was not removed.

Examination revealed the abdomen somewhat larger than that of a woman at full term of gestation. The tumor was elastic, apparently thin-walled and fluctuation could be elicited over the entire tumor which filled the abdominal and pelvic cavities. The physical signs on palpation and percussion were those of an ovarian cyst, but the clinical history did not coincide with that diagnosis. Examinations of the urine, made repeatedly, were negative. There was no sugar nor albumin present. The specific gravity was 1020, but there were only 42 to 44 ounces excreted in twenty-four hours. There was no swelling of the feet or legs. There had not been any swelling at any time in her past history. Vaginal examination revealed the uterus of normal size but retroverted and pushed down by the tumor until the os presented at the somewhat relaxed vulva. The tumor was more prominent on the patient's right side and in the upper part of the abdomen than in the lower segment.

The patient was admitted to my private hospital September 2, 1901. After having her under observation a few days and getting her clinical history, there was every reason to believe that the diagnosis of ovarian cyst was to be questioned. It appeared certain that something wrong in the tumor was causing the sepsis, Tapping the tumor for relief did not suggest itself favorably to the writer. From the clinical history it was evident that the kidney on the right side was involved, but the writer at that time had never seen a kidney as large as this tumor.

An operation for removal of the tumor was advised and performed September 6, 1901. The abdomen was opened in the median line for a distance of four inches so as to be able to get the hand inside the abdomen for exploratory purposes. The tumor was not adherent to the anterior abdominal wall. It was easily determined that the uterus and ovary were not connected

with the tumor in any way and were perfectly normal. The incision was enlarged upward to two inches above the umbilicus. The colon was found glued to the tumor and it was easy to determine now that the tumor was retroperitoneal. It was tapped to the right side of the colon with a Tait's large-sized trocar and three and a half gallons of thick, pea-green colored pus removed. Every precaution was taken not to soil the peritoneum. The opening made by the trocar was closed by pressure forceps, the peritoneum divided along the anterior wall of the tumor for a distance of about twelve inches and enucleation of the sac commenced. This was accomplished without tearing through the wall of the cyst and with surprisingly little hemorrhage. The pedicle, consisting of renal vessels, was ligated with catgut. The ureter was ligated separately and the tumor removed. There was now an enormous space denuded of peritoneum. An opening was made through the loin and through this a rubber drainage tube was introduced. As there was general oozing over the raw surface, a strip of gauze was packed into the cavity left by the removal of the tumor and the end carried out through the opening in the loin alongside of the rubber tube. The peritoneal edges covering the tumor were closed by a running stitch of catgut. The gauze pads used to protect the viscera were found not stained. The abdominal wound was closed without drainage. The patient suffered profound shock, rallied very slowly and at the end of twelve hours the pulse was 140 and temperature 101°. Convalescence was established on the third day. All the gauze was removed on the morning of the fourth day. The drainage tube was kept in place for a week. The wound at the drainage site closed at the end of the third week and the patient left the hospital on October 5th, thoroughly convalescent. She gained rapidly in strength and within a few months had recovered her former weight of 165 pounds. She is now enjoying the best of health.

CASE II.—Mrs. W., æt. 66, of Greenup, Ky., was referred by Dr. Brady. She is the mother of seven children, including twins who are 34 years old. The tumor was first observed soon after the birth of the twins. She had considerable trouble with her kidneys during this gestation, with frequent desire to empty the bladder. She passed great quantities of urine at times and a diminished quantity at others. When she first observed the tumor it was about the size of a quart cup and was situated in the left upper quadrant of the abdomen. It was elongated, very hard and not very tender. The tumor remained about the same until

the latter half of a subsequent pregnancy, about two and a-half years afterward, when it apparently disappeared. She went through the gestation without any great amount of disturbance. After she was delivered she again noticed the tumor. It remained about the same size as the first time, but apparently softer to the touch, until her last pregnancy. The tumor disappeared during the latter half of this gestation. She had considerable disturbance from her kidneys. Her feet and legs were badly swollen. During the last months of pregnancy she had great stomach derangement with excessive vomiting. After this delivery she again noticed the tumor. It was somewhat larger than before but did not cause great inconvenience. The swelling of her feet and legs disappeared soon after her delivery. She passed through the climacteric period without much trouble and with very little disturbance from the tumor. After the menopause the tumor gradually increased in size from year to year but did not cause any great pain or disturbance, except from its size, until January, 1901. At that time she was called to the bedside of her son and daughter-in-law who were both down with typhoid fever. She stayed with them five or six weeks, helped to nurse them and did a great deal of hard work.

The tumor at this time was about as large as a full term gestation. In about four weeks she developed fever and was quite ill. The physician, supposing that she had contracted typhoid fever, sent her home, and her nephew, Dr. A. S. Brady, was called to see her. After he had had her under observation for three days he was convinced that the fever was of septic origin and that her tumor was the source of her trouble. He regarded the tumor as probably ovarian and advised an immediate operation for its removal. The operation was opposed by the family, and the patient absolutely refused to be operated upon. She grew rapidly worse and the tumor enlarged at a very rapid rate. She became very anemic. The fever ranged from 103 to 104° and her pulse was 120 to 130 per minute and very feeble. She had violent sweats and all the symptoms of well marked sepsis.

On April 10th, three weeks after her illness commenced, the doctor told the patient and her friends that she must be operated upon at once or she would die in a few days. She then consented to the operation and the writer was sent for. The general condition was that above described. The patient could not retain the blandest nourishment in her stomach. She vomited frequently. This had continued for a week or more. She was greatly emaci-

ated. A radical operation for removal of the tumor at that time, in her condition, would prove fatal. On physical examination the tumor was found to be larger than a full term gestation. Dulness extended over the entire tumor on the left side clear to the spine and from the ribs down. The tumor filled the pelvic cavity, pushing the cervix down to the vulva.

I was in doubt at that time as to the nature of the tumor. It was tapped on April 10th and three and a-half gallons of milky-colored pus removed. It was now evident that the tumor was a pyonephrotic kidney. It was agreed that if the patient survived the tapping and her condition improved we would remove the tumor. She improved rapidly after the tapping, the fever subsided, and for a half a year or so she was comparatively comfortable without pain and without sepsis, but the tumor commenced to refill so that it could be noticed at the end of a week. It increased in size rather slowly at first, then after a few months more rapidly until it reached its former size.

After she got up she again refused to have the tumor removed and would not consent to it until she again developed sepsis. After three or four months' illness her condition became so desperate and her suffering so great that she could no longer endure it. She then consented to be moved to the city, and entered the Presbyterian Hospital November 10, 1902. Her condition was very desperate. She had all the symptoms of sepsis well marked —high temperature, rapid pulse, frequent vomiting and diarrhea.

From the fact that she improved so rapidly after the previous tapping it was decided to again tap the tumor and let her again recover from the septic condition before operating upon her. This was done November 11, 1902, and about three gallons of pus were removed. At once her symptoms all improved; not so rapidly as after the previous tappings, but within four days her irritable stomach subsided, her temperature went below 100 and her pulse had improved in volume. The night sweats stopped, and her appetite returned but the tumor began to refill.

The operation for removal of the tumor was deferred until November 18th. The incision was made in the middle line, extending from three inches below the umbilicus to three inches above. The tumor was exposed and tapped to the left side of the colon. About one and a-half gallons of pus were removed. The viscera were well protected by gauze pads. As in the previous case, I divided the peritoneum over the tumor and commenced enucleation with the hope of separating the sac without

rupturing it. Enucleation was much more difficult in this case than in the former one. It was almost impossible to separate the sac from the adjacent tissue in many places. By manipulation it could easily be determined that there was still some pus in the sac. When it was almost entirely enucleated the sac gave way and the pus, amounting to two or three ounces, was spilled, contaminating the wound back of the peritoneum but not getting inside of the peritoneal cavity. The sac was laid open and thoroughly mopped out with gauze and the parts were cleansed as thoroughly as possible. The sac was then enucleated completely, the renal vessels and ureter were ligated with catgut and an opening was made through the loin for drainage. There was very profuse oozing over much of the denuded surface. The same technique was carried out as in the previous report in reference to packing with gauze and placing a drainage tube. The peritoneum was closed with a running suture of catgut and the abdominal wall was closed in the usual manner without drainage. The patient rallied within two hours, had a slow but satisfactory convalescence, went home in the sixth week after the operation and is now thoroughly well.

DISCUSSION.

DR. HERMAN E. HAYD, Buffalo.—This paper is very interesting to me. The paper I read before the Association at the last Chicago meeting,—namely, in 1895,—was on the same subject. So far as making a differential diagnosis between a hydronephrotic cyst and an ovarian cyst is concerned, it is exceedingly difficult, if not impossible, because the abdomen is uniformly distended and the urinary symptoms are often negative. Even if one should make a cystoscopic examination it would not help very much, as this ureter is closed. In the case I reported over twenty quarts of water were obtained. The tumor was removed through an anterior incision at the Woman's Hospital, Buffalo. Dr. Frederick assisted me. The patient was a woman, fifty years of age, who manifested no symptoms that suggested any trouble other than the huge size of her abdomen. So far as pyonephrotic troubles are concerned, they are easily made out. The tumors do not assume the immense size that the simple cystic tumors do, and at the same time they are associated with so many other constitutional symptoms.

I congratulate the essayist on the results in his cases. I do not believe it is good practice to attack these cases, however, through an anterior incision. It is better to do a nephrotomy and drain the kidney from the back. After the cyst has contracted, it

is a simple matter in the course of a few weeks to remove the kidney through a posterior loin incision.

DR. JAMES F. BALDWIN, Columbus.—In the paper I read day before yesterday, I brought up this point of physical diagnosis. At the time Dr. Hayd read his paper I reported a case in which I did not make the diagnosis. But I could make it to-day without trouble. Dr. Hall would have made the diagnosis in his two cases if he had resorted to the means alluded to in the paper I read two days ago. In his cases the kidney was behind the colon, developing at the expense of the outer leaflet, and by inflating the colon through the rectum it would have shown the colon passing over the tumor to the inner side, which it could not do in a case of ovarian tumor as it develops below.

There is one point, as between ovarian tumor and tumor of the kidney, that will enable one to make a positive diagnosis in practically every case. I have used this method in such cases, and have made the diagnosis without any difficulty. As I understand, Dr. Hall found the colon running to the inner side. He made an incision to the left of the colon on the left side. If he had placed his hands over the abdomen while an assistant was pumping air in there, he would have outlined the colon perfectly. It is one of the easiest things to do.

In my paper I said that a splenic tumor is sometimes mistaken for a left kidney or tumor of the left kidney, but the spleen overrides the colon. It is bound to be on the other side in the case of an enlarged spleen. But the differential diagnosis in these cases should be made with the utmost simplicity. Ordinarily, it is not necessary to inflate the colon. During the discussion of Dr. Hayd's paper, Dr. Ross stated that in these cases we could make the differential diagnosis because of the lobulated condition of the kidney. I have not detected that feature in my cases. I have been able to find it since then. In the cases reported this morning this lobulated condition of the kidney did not exist. We cannot place too much stress on this point. The case I reported was a simple cyst, with ovarian tumor, but without any lobulation.

DR. EMIL E. GUENTHER, Newark.—Like Dr. Hayd, I believe the best incision in these cases is through the back. I do not see why, especially if the case has been tapped and the character of the tumor or cyst has been made out, we should open up through the peritoneal cavity, thereby running the risk of infecting this cavity.

I would like to ask Dr. Hall whether catheterization of the ureters would not have helped him materially in making a diagnosis?

DR. C. C. FREDERICK, Buffalo.—I have seen three cases similar to those reported by the essayist. In the first two, when I got into the abdomen, I did not know whether they were ovarian cysts or what they were. I enucleated the kidney *in toto*. One of them was a pyo-, the other a hydronephrosis. In both cases the patients were women over sixty-five years of age.

Dr. Baldwin called attention to the location of the ascending

colon in tumors of the kidney some three years ago, and since that time I have had one case. The tumor was more to the right side of the abdominal cavity than to the left. I thought of what Dr. Baldwin had said in reference to this matter, but when I opened the abdomen I did not follow out his idea of inflating the colon to determine its location. In making an exploration I found that the colon lay to the inner side of the tumor. The abdominal incision was closed and I opened into the loin behind. It was a pus case. I believe I would have lost my patient had I operated through the abdominal cavity. There was a good deal of tumefaction around the wound, which was drained. The point Dr. Baldwin raises is a very important one, and little or no harm can come from carrying it out. By locating the colon in relation to the tumor, and being guided accordingly, we may know what we are about. It takes but two or three minutes to do this.

DR. WILLIS G. MACDONALD, Albany.—From what has been said, I have yet to be convinced that any harm came from the fact that Dr. Hall's diagnosis was wrong. The best measure of our work is the success of it, and Dr. Hall's cases were successful.

As to the technic of his operation, I think it presents many distinctive advantages over the advocates of the loin incision in a tumor of this nature. I have done a large number of secondary nephrectomies after the use of a drainage tube in the back, and I am not altogether pleased with that operation. The removal of the kidney by *morcellement* is associated with very serious hemorrhage, and frequently it is very disastrous to the patient. You can remove a large pus sac, such as Dr. Hall described, with far more ease than you can when it becomes consolidated around a drainage tube or sinus. I have removed enough of these pus sacs to know something about them. I have seen a number of men undertake that method, and after a good deal of sweating and considerable saline transfusion, I have seen them pack the wound with yards of iodoform gauze after which the patients were taken from the room.

THE PRESIDENT.—Were they not tubercular cases?

DR. MACDONALD (resuming).—Some of them were tubercular; others were pure cases of pyonephrosis.

A lobulated kidney is different from that which Dr. Hall speaks of. When a patient has a lobulated condition of the kidney, one needs to be very careful before he puts his hand to the scalpel. The lobulated cystic kidney seldom reaches the great size presented by the case of Dr. Hall. Such kidneys are rather expressions of what has been described as congenital cystic kidney, or multiple cystic kidney, and are likely to be dovetailed, with one side greater than the other. A number of such cases have been described by Osler. I, myself, have operated on three or four such cases.

I think we owe it to ourselves to call the attention of surgeons

to the difficulties in diagnosis some of these cases present, and we should avail ourselves not only of the history of the case, the results of physical examination, and the method so clearly brought forward by Dr. Baldwin, as well as by the further methods we have of exploring the genitourinary tract by means of catheterization of the ureters.

DR. HALL (closing the discussion).—I am very much obliged to the gentlemen for their discussion. The question of differential diagnosis in these cases is one that does not worry me very much. In the first case reported, I was convinced from the clinical history that the patient formerly had an enlarged kidney. Even after several examinations, in which the urine was entirely negative, without pus, blood or albumin, I was reasonably certain that she had an ovarian cyst, and I did not carry the examination any further. However, the patient made a good recovery.

In the second case I went to the country to see the patient, presuming from the letter I received, that I would have an ovarian tumor to deal with. I tapped the woman, and made rather a hurried examination. I did not go into all phases of the case, but supposed she had an old ovarian tumor, and the question was one of immediate relief. A large amount of fluid was withdrawn, which apparently was not ovarian. I knew then I had a suppurating kidney. I did not inflate the colon in this case. I grant that the method outlined by Dr. Baldwin two days ago is a good one, and in small-sized tumors, say those the size of a six months' gestation or less; where the diagnosis is attended with difficulty, we can make a diagnosis by the method presented by Dr. Baldwin. If we take the ordinary Davidson syringe and inject air, in place of water, we may be able to make the diagnosis by inflating the colon. In the last case I knew I had the kidney to deal with. I would not do the operation that has been suggested this morning by Dr. Hayd—namely, first draining the kidney and then taking it out afterward, for the reasons mentioned by Dr. Macdonald. In my opinion that would be bad surgery.

DR. HAYD.—Do you take out the kidney or the capsule? If you take out the capsule the woman will bleed to death, but if you take out the kidney it is quite a safe operation.

DR. HALL.—I will answer Dr. Hayd's question by saying I took out all of the sac in both cases.

In reference to the method of operating, one of the speakers thought it would have been better to have drained. In the last case, the elderly woman, the tumor was glued to the vena cava, so that I could turn it this way (illustrating), then I turned it the other way. I was not certain under any circumstances that I was not going to open the vena cava. If I had drained the wound from the back, then peeled the capsule out, when it contracted I would likely have torn off the vena cava. I do not think I could have operated and removed it and saved the patient's life. The ureter in this case was not patulous.

SURGERY OF THE ILEOCECAL VALVE FOR NON-MALIGNANT DISEASES.

By N. STONE SCOTT, M.D.,
CLEVELAND.

THE principal structures which enter into the intestinal tract are the serous, the mucous and muscular coats. At various places along the alimentary canal occurs an increase of one or more of these structures; this is especially true of the circular muscular fibers which are so grouped at certain points as to produce a valve-like action; whereof the pylorus, the ileocecal valve, and the rectal valve are the three prominent examples.

The fact is well established that the pylorus and rectal valves are peculiarly liable to inflammatory diseases with consequent hypertrophy or contraction of the tissues and attendant partial obstruction of the tract. It would be most natural to suspect the other one of the three, the ileocecal valve, of similar tendencies.

Again, the pyloric end of the stomach is rich with glandular structures, and it is in this part of the stomach that we find gastric ulcers with the resulting cicatricial contractions and stenoses. So in the small intestine the glandular elements are much more numerous at the lower end of the intestine, where the ileocecal valve is located, and here, too, is found especial liability to ulceration in various diseases, such as typhoid fever and tuberculosis. Why should we not expect to find stenosis and contractions following such ulceration, as has been noted after ulcers of the stomach?

The medical history of this subject is remarkable—for its silence!

Senn[1] says of Legg: "This author could find in literature only six cases of non-malignant stenosis of the ileocecal opening." These were all found at post mortem. Three or four typical cases might be quoted:

"Miss ——, twenty-six years of age, was admitted into the hospital in April, 1858. Since she was five years old she had suffered from occasional attacks of colic, attended by constipation

[1]Practical History of Surgery, Senn, 1901, page 925.

and vomiting. After such an attack eight years ago, a number of cherry-stones passed with the feces. Recently the attacks became more frequent; when admitted to the hospital she presented many symptoms of obstruction. In the right iliac fossa, on percussion, a dry crackling sound could be heard and felt. The symptoms of obstruction gradually became worse, and a few weeks after admission she died. At the necropsy the entire colon was found empty and contracted, the ileum very much dilated, so much so that the lower portion measured seven inches in circumference. On opening it fluid feces and a few fruit-stones escaped. Ileocecal orifice so contracted that it will admit only a No. 9 catheter."

Schroeder Van der Kolk's case showed at post mortem "An opening even smaller, and in the lower portion of the ileum, which was enormously dilated, a large mass of cherry-stones and fragments of bone were found."

At the necropsy of still another case, "The small intestine was found very much distended and the colon and rectum were contracted and empty. Just above the ileocecal valve the ileum was distended to the size of a fetal head, and adherent to the posterior abdominal wall, mesentery and coils of the ileum. The walls of the pouch were thickened and of a brown color. When opened, it was found to contain one hundred and twenty plum-stones and ninety-two leaden bullets. The ileocecal valve was nearly closed and was permeable only to fluids."

Herz[1] reports under the title of "Insufficiency of the Ileocecal Valve," two cases found at post mortem. He says: "There was present an inflammation of the ileocecal valve, especially on the ileum side." The clinical history of his cases is similar in all respects to that of other authors reporting cases of obstruction of the ileocecal valve.

Mayo[2] reports two cases as follows:

CASE I.—Miss E. V., twenty-one years of age, suffered from obstipation since childhood. For a year she had been troubled for days at a time with pain and soreness in the region of the appendix. Muscular rigidity was noted at examination. She was operated for appendicitis August 16th, 1899. At this time the small bowel was found to be full in spite of energetic purgation. At the junction of the ileum and cecum the caliber was markedly reduced, having the appearance of a string tied around reducing the lumen one-third. The patient's condition was not

[1] Wiener medizinische Wochenschrift, 1897, page 1651.
[2] Annals of Surgery, Vol. 32, page 364.

improved by this operation, and in December of the same year a plastic operation was performed on the ileocecal valve similar to the Heinicke-Mikulicz pyloroplasty, with permanent recovery.

CASE II.—Miss L. C., aged twenty-five years, was the subject of chronic constipation; during the attacks of obstipation she was sore in the cecal region. A diagnosis of chronic appendicitis was made and the case was operated February 27th, 1900. The appendix was found to be normal, while the condition of the ileocecal coil was similar to that of Case No. 1, the same plastic operation was performed, and the same gratifying results obtained.

Beside these two of Mayo's, the other eight cases mentioned were all found at post mortem on account of the gross secondary changes which had taken place.

How many have passed beyond the reach of our profession prepared for some fatal disease by a contracted ileocecal orifice cannot be computed. Nor is it possible to form even an approximate estimate of the death list due directly to contraction and obstruction of the ileum, but incorrectly labeled.

The rarity of recorded cases is not so strange when we consider the virginal character of the territory under discussion. Literature gives us not only a scarcity of cases, but no adequate description of the disease or its diagnosis, its causes or its cure.

Then, too, the symptoms and signs of a contracted ileocecal valve are quite obscure, there being no pathognomonic symptoms, but merely a combination of those noted in appendicitis and obstruction of the intestine proper. (By this is meant obstruction of the small intestine at any other points except at the ileocecal valve.) While it is true that acute complete obstructions show similar symptoms, whether they be intestinal or ileocecal, we are not now especially concerned with this condition, nor with the accidental presence of foreign bodies lodged at a normal ileocecal valve. A chronic ileocecal obstruction will be more easily mistaken for chronic appendicitis than for chronic intestinal obstruction. There are several reasons for this: *First*, because the symptoms of appendicitis are more numerous and marked than those of the intestinal obstruction; *second*, because appendicitis is itself of more frequent occurrence than either the intestinal or valvular obstructions; *third*, a large proportion of these cases suffer from a combination of chronic appendicitis and ileocecal contraction.

The following are a few of the more important signs and symptoms:

Periodical pains at McBurney's point, with thickening of the

tissues, sometimes to such an extent as to form a good-sized tumor. Tenderness of the same point sometimes accompanied by rigidity of the abdominal muscles is found.

Pain in the stomach; acid or gaseous eructations, and other dyspeptic symptoms. Auto-intoxication, as manifested by headache and various neurasthenic conditions. Disturbances of the bowels, usually constipation, but in some cases diarrhea followed by constipation. Relief by enema found to be inefficient, unless the ileocecal valve is reached. Evidences of dilatation of the lower end of the ileum, of which the most prominent symptom is the presence in the right iliac fossa of a tumor which comes and goes, usually accompanied by colic-like pains, sometimes disappearing with a gurgling sound. Of course, general asthenia is noted in this as in most other disorders of the alimentary canal. In severe attacks there is fever and sometimes vomiting. Not all the symptoms mentioned obtain in every case; in fact, a large proportion of them may be absent, thus lending the greater obscurity. The most of my own cases have either been the subject of stenosis in other parts of the alimentary tract, showing a decided tendency to hypertrophic inflammation in certain portions of the tract, or have had typhoid fever. There was a reasonably clear history of this in all but one of the seven cases reported below.

CASE I.—Ten years ago I operated on a young lady, twenty-six years of age, for chronic appendicitis, the symptoms of which she had felt for twenty years. The operation was a simple one, the appendix showing marked signs of appendicitis. She made a rapid recovery, but was not one whit better than before her operation; frequent examinations, before, at, and after operation excluded the possibility of kidney, ovarian, or gall bladder disease. I am now satisfied that she was the subject of an ileocecal valve disease.

CASE II.—Eight years ago I attended Rev. H. during his final sickness, which at the time was diagnosed as a probable cancer of the ileocecal region. He had been a semi-invalid for many years. On account of nervous prostration, he was obliged to resign his pastorate and later to give up his business. For years he had shown more or less dyspeptic symptoms, and was compelled to use cathartics liberally. At post mortem we found a stricture of the ileum near the cecum, evidently the site of a healed ulcer. This had undergone malignant degeneration. On careful inquiry we learned that he had had typhoid fever before his marriage, some thirty years since. This fact, however, had

never been associated in the minds of the family with his long-continued illness, although he was never really well after the typhoid. Is it not quite probable that a repair of this incomplete obstruction would have saved years of invalidism and possibly prevented the development of a malignant disease at the site of the constant irritation?

CASE III.—Miss D., aged twenty-two years, was referred to me by Dr. Gentsch. She gave a good previous history until about four months before I saw her, when she was taken with typhoid fever. She did not make as complete recovery as she ought, and it became evident that she was suffering from chronic appendicitis. September 19th, 1899, I performed an appendectomy. The appendix was long, convoluted, and thoroughly adherent to the head of the colon; after its removal the mucous membrane and subjacent tissue presented all the evidences of chronic inflammation with hypertrophy; patient made an uninterrupted recovery, although rather slow. At the time of operation the ileocecal valve was examined, but nothing very marked was discovered, although the valve seemed smaller than normal. The bowels, however, did not regain their normal function as before the typhoid, but gave her considerable annoyance; when they were worst some pain was noted in the right side, while a soft tumor would appear and disappear. Diagnosis was then made of obstruction of the ileocecal valve, but operation was refused. The symptoms of obstruction gradually subsided; when I last saw her she was suffering with constipation, but not from the attacks simulating appendicitis with obstruction.

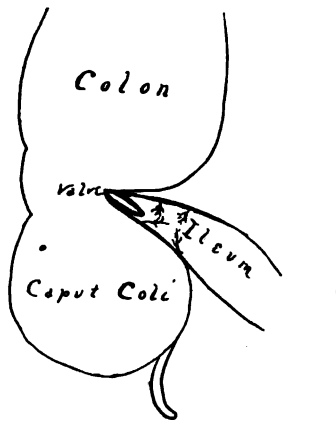
CASE IV.—Mrs. B., thirty-six years old, is the mother of two children, aged, respectively, eleven and nine years. She has never miscarried; at the birth of the first child she had a severe post-puerperal infection, but apparently made a complete recovery. August 20th, 1898, I operated on her for chronic appendicitis, making an intermuscular incision at the ordinary site, with no complications. On the third day she was removed from the hospital to her own home; recovery was rapid and uninterrupted.

In the Fall of 1902 she suffered from a moderately severe attack of typhoid fever; following this the very slight constipation, which she had sometimes noted previous to the typhoid, became much worse. During the early Spring of 1903 she began to have attacks which stimulated appendicitis with obstruction; these attacks were ushered in with chills, abdominal tenderness at McBurney's point, and, when severe, were associated with persistent vomiting.

The only relief she could secure was through free catharsis, which was at times difficult to gain. She has now learned the premonitory symptoms of an attack, and has apparently been able to abort it by an early resort to cathartics. These symptoms are headache, general malaise, distress in the right side, associated with a moderate degree of constipation. The certain symptom which she has learned to look for has been the rising up of a soft bunch in the ileocecal region, and its disappearance, sometimes with a gurgle, sometimes without. When this train of symptoms occurs, unless the bowels can be quickly and thoroughly moved, vomiting and abdominal distress, with fever, supervene. Operation has been under advisement, but, as she has apparently learned how to abort the attack before the symptoms become too severe, operation has been postponed.

My first ileocecoplasty was performed on a colleague in the profession, a prominent nerve specialist, who made his own diagnosis, the first on record made prior to operation. His case has been an exceedingly interesting one to me including as it has a gastroenterostomy also.

CASE V.—Dr. U. first consulted me in January, 1898. For a number of years he had suffered from auto-intoxication, especially after eating meat, apples and certain other articles of diet. Dur-



Case V.—Ileocecal valve obstruction. Dilatation of ileum.

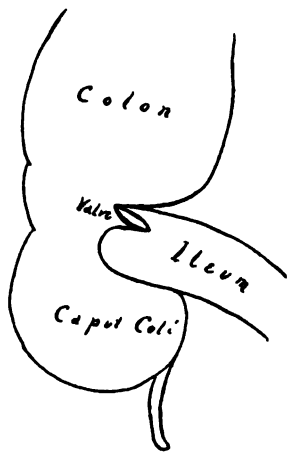
ing the earlier years this had been accompanied by constipation, alternated with diarrhea. But at the time of the consultation the constipation was constant, so that some cathartic must be employed at least every other day; this, in spite of the fact that he

had but a few months previous undergone a valvotomy at the hands of one of our leading proctologists. Aloes and other medicines for the lower bowel were not then found to be very efficient; those acting upon the upper intestinal tract were more reliable; calomel and cascara sagrada were the principal remedies. February 19th, 1898, I made a triple operation consisting of an anterior gastroenterostomy with a jejunostomy and jejunoplication for stenosis of the pylorus, with a marked dilatation of the stomach. On the tenth day the observation was made that the stools were more nearly normal than for several years. Apparently, the bile was having an opportunity to mix with the chyle instead of being hustled along by the use of cathartics, as had previously been the case. After the gastroenterostomy he was vastly improved, both as to stomach and bowels; a year later partial obstipation returned. The cathartics which formerly had been most efficient, namely those acting upon the upper small intestines, were not now as potent as before. Enemas were not usually efficient when given in the ordinary way, but only when so given as to reach around to the ascending colon. Slight attacks of pain in the right side were present, usually associated with a sense of the presence of a tumor. This tumor could be seen to appear and disappear with rhythmic periodicity lasting only a few moments, was typanitic and easily compressible, frequently subsiding with a gurgle. This was evidently a hyperperistalsis of the intestine and was not present after a free bowel movement. He, himself, made a diagnosis of obstruction of the ileocecal valve, with a probable coincident chronic appendicitis. I concurred in this opinion, both of us agreeing that the appendicitis was of minor importance.

January 28th, 1901, I performed the operation, making the intermuscular incision at McBurney's point. The appendix was found to be small, but the subject of chronic appendicitis. The ileocecal valve was very small, barely admitting the tip of the finger, blood-vessels were prominent, the structures in the neighborhood of the ileocecal valve greatly hypertrophied, and the ileum was dilated for several inches. The congestion and hypertrophy were apparently limited to the first two or three inches of the ileum; dilation extended a number of inches beyond this. Operation consisted in making a transverse incision through the ileocecal valve in the axis of the small intestine, a distance of some three inches. This was sewed up in a transverse manner similar to the Heinicke-Mikulicz operation. Recovery uneventful. Benefits of

the operation were very marked and continue up to the present time.

CASE VI.—Miss C., while away at college in 1880, was stricken with an accute disease probably cerebrospinal meningitis. In 1881 she was placed in Dr. Weir Mitchell's hands with the special senses much impaired and the tendons of the feet and hands much contracted. He devotes one chapter of his Book on Nervous Diseases to her case. Dr. Keen performed eleven tenotomies for the contractures, and in the course of several years she was restored to a fair degree of health. In 1892 she again went to Dr. Mitchell on account of a relapse, but without the benefits previously received. In 1894 one of our gynecologists



Case VI.—Ileocecal valve obstruction. Hernia of the low lip.

did an oophorectomy for hysteroepilepsy, with marked relief of the hysteroepilepsy. Her digestive functions, however, were very unsatisfactory; during the next few years she passed through several attacks of enteritis and colitis, some of them of a decided membranous character. November 11, 1898, I performed a gastroenterostomy for a stenosis of the pylorus and greatly dilated stomach. Two weeks later her father wrote me a letter from which I quote a single sentence: "I wish to congratulate you upon the satisfactory result already so clearly shown in the improvement of my daughter's digestion."

The after history of this case is very similar to that of the

preceding one, except that the presence of the recurrent tumor was not nearly so marked.

April 17, 1901, I performed an ileocecoplasty; on opening the abdomen the ileocecal valve and its neighborhood were decidedly congested and the lower end of the ileum dilated. On opening the small intestine and examining the ileocecal valve, it was found that, while the valve was smaller than normal, it was only one of the factors in producing partial obstruction at this point. The compensatory hypertrophy which had taken place in the former case had failed to ensue in this case when the ileocecal valve became obstructed; instead, the lower lip of the valve had gradually dilated, producing a sacculated condition of the lower end of the ileum and bulging into the caput coli. (See Illustration, Case VI.) When the lower end of the ileum became distended this sac would also distend, and by making pressure upon the ileocecal valve tend to close it. Convalescence was very satisfactory. The bowels, which for some years had only moved after powerful cathartics, were within a week's time as regular as clock-work, and so they have remained ever since.

CASE VII.—Mr. B., aged 36 years. His health had been good until about eight months previous, when he became ill with a persistent diarrhea, followed by obstinate constipation.

August 22, 1903, operation. The appendix was found behind the colon with evidences of recent inflammation. The ileocecal valve and adjacent one inch of the ileum showed deep inflammation; the serosa had lost its glistening appearance, and all the tissues at this point were greatly thickened, so much so as to seriously narrow the lumen of the intestine; the ileocecal valve and the ileum laid open; at this point, corresponding to the point of deepest congestion of the serosa, was an ulcer about one and three-quarter inches long and involving three-fourths of the circumference of the ileum. An ileocecoplasty was performed, as in the preceding cases. The after history has been all that could be desired. I have since been informed that Dr. Reed, who saw him a few times early in his trouble, thought he had typhoid fever.

The etiology in all but one of the seven cases of my own just reported is either a hyperplastic valvitis or ulceration, the result of typhoid or other diseases. Since ileocecal contraction sometimes appears coincident with the more common chronic appendicitis, and especially since many of the symptoms are identical,

it behooves those of us, who are handling the knife, to make systematic examination of the valve during appendectomy.

In my opinion non-malignant obstruction of the ileocecal valve, though not more prevalent than heretofore, will be far more frequently recognized, and therefore rectified, in the future than in the past.

THE CHOICE OF METHODS FOR CLOSING THE ABDOMINAL (PARIETAL) INCISION.

By EDWIN RICKETTS, M.D.,
CINCINNATI.

HERNIA following any abdominal incision is looked upon as a reproach, even though preceded by brilliantly applied intra-abdominal surgery, and the desired results in all other respects obtained. We have incontrovertible proof that the ideal method for closing the abdominal incision has not been attained. The secondary sections for hernia should satisfy the most critical that my statement is correct; and to this should be added the cases from which buried catgut, silkworm gut, silver wire, kangaroo tendon, with and without suppuration is being removed. Rapid transit carries to his or her home many a patient who has been duly recorded as cured. Hernia develops to be detected by the family physician anywhere from six months to a year or more later. That hernias occur following many operations done even in the larger and best conducted hospitals of the land, is a fact. These institutions are the ideal workshops to many, from which they would have us to believe that perfect asepsis and antisepsis exist continuously from the hour of entrance to the institution to the ending of the needful surgery. Notwithstanding the institutional buried suture exponents and their adherents, enough buried sutures have worked out and are being picked out to furnish much material for serious surgical reflection.

Hernia never occurs above the upper or below the lower angle of the line of incision; it is always directly within it. The theory of the shortest possible incision is backed up by practical results. It should be made through the linea alba, caution being taken that the sheath of either rectus is not cut through, for this is the natural tissue for binding and holding better together the long connecting fibers of the rectus muscles.

Aseptic methods must come as the result of the eternal vigilance of common surgical sense, which should reign supreme. You

have inflicted the incision; as far as it is possible, it is yours for the necessary manipulation, not for the fingers of another Aseptic union is an operator's ideal that has never been attained. It is, in other words, an impossibility; to well-nigh reach it, however, is quite possible.

The kinds of material generally in use are silver wire, silkworm gut, kangaroo tendon, catgut, and silk. Terrace suture of catgut consists virtually of a continuous Lembert suture, beginning at one angle of the peritoneal incision (layer by layer), and ending at the other angle of the skin incision, but not penetrating the same. The objections to this method are:

First: The material used is a foreign body. Second: Added risks of infection. Third: The coaptation of the peritoneal, fascia, and fat edges is uneven; they are rolled in on themselves until the line of the incision is "corded." Fourth: The suture pressure is continuous and by the engorgement of the tissue in the healing process, it must be increased at times to strangulation. The tax for absorption of this catgut by the tissues in which it rests is surgically imposed.

The contribution of Dr. Dorsett on the infection of catgut at our meeting in Washington last year should be read to be appreciated.

Some close the peritoneum with a Lembert suture of catgut, or silk, and close the remainder of the wound with buried silkworm gut, kangaroo tendon, silver wire, or silk. With this or the terrace suture, the peritoneum drops away from the muscles, leaving a space which of itself is a serious objection. The peritoneum will absorb or digest catgut or fine silk sutures. Muscle fascia and fat are comparatively poor media for absorption of the foreign bodies under consideration. Buried shotted wire suture deserves but a passing thought, and that merely to condemn it. The same can be said of the through-and-through silver wire suture, the removal of which is on the line of surgical barbarism. Some operators first adjust for tying the through-and-through suture of silkworm gut or silver wire, closing the peritoneum with fine silk or catgut. The fatty tissue is brought together by a longitudinal corkscrew suture of silkworm gut, the lower end coming through the skin just below the lower angle of the skin incision, the upper end coming out through the skin just above the upper angle of the incision. Both ends are buttoned tightly, after which the through-and-through sutures are tied, or shotted as the operator may select.

Through-and-through sutures with the corkscrew suture are removed by the tenth day. Possibly the oldest suture material for through-and-through work is pure silk. Some prominent operators of to-day make use of it. With thorough asepsis it is a question if this material cannot be used as successfully as the silkworm gut for through-and-through suture; providing it is removed within five days. To my mind the through-and-through sutures of silkworm gut, with the closure of the peritoneum with interrupted sutures of fine silk, will permit us to attain nearer the ideal method than any other. Silkworm gut is impervious to any infection. It is easily rendered aseptic by boiling.

We should work with an eye to the dry method from the beginning to the end of the parietal incision, using a long-handled Peaslee needle, with an eye sufficiently large to carry the suture material with ease. Standing on the right side of the patient, let the unarmed needle point penetrate the peritoneal edge at the lower angle one-quarter of an inch from the edge opposite. Before starting the point through the sheath of the rectus, push the peritoneum back so that a good hold on the muscle can be obtained, letting the needle point penetrate the same from one-half to three-quarters of an inch from the line of incision. Then thread the needle with the silkworm gut, after which withdraw the threaded needle leaving the suture *in situ*. Next start the unarmed needle point through the skin on the side of the incision nearest to the operator in line with the opposite needle puncture one-quarter of an inch from its edge, going through the muscle, including one-half to three-quarters of an inch to come out through the peritoneum one-fourth of an inch from its edge. Then thread the needle with the peritoneal end of the silkworm gut, withdrawing the threaded needle, disarming the same. Repeat this process at intervals of not more than one-half inch until the wound is ready for closing. Close the peritoneum with interrupted sutures of fine silk midway between the interrupted through-and-through sutures. Render the field of operation, including the sutures, as nearly aseptic as possible by wiping both with gauze moistened with 98 per cent. alcohol. The greatest care should be exercised in tying each suture. To tie them too tightly means more damage, promising a greater number of hernias than to tie them in a looser manner. Cut the tied sutures to the desired length, washing them again together with the skin surface of the entire abdomen with alcohol. Dress

the wound with carbolated gauze held in place by means of the oxide of zinc adhesive plaster. Keep the wound dry and know that it is dry, even if the wound has to be exposed to the air daily. Remove the stitches as they are indicated anywhere from the fifth to the tenth day. This is the technic that I advise and employ.

DISCUSSION.

DR. ROBERT T. MORRIS, New York.—The recently deceased Whistler said that nature was gradually approaching art. There is one thing we forget in closing the abdominal incision,—namely, atmospheric pressure. We try to do what nature would rather do by atmospheric pressure. If we leave things as we find them, it seems to me we are doing the best thing for the patient. I have often tried to improve upon the Lord's method, and sometimes I thought I did much better, but in the end it was not as well. (Here Dr. Morris went to the blackboard and illustrated his method of closing the abdominal incision.) If we repair the cut edges of different structures separately, we leave things as they were found. No suture, however, should enter fat. Fat layers are to be held by atmospheric pressure only.

DR. L. H. DUNNING, Indianapolis.—Dr. Morris has given us a beautiful demonstration of how to close the abdominal incision, but I believe he has lost sight of the fact that we have atmospheric pressure opposed by intra-abdominal pressure in cases of vomiting, retching and coughing. In these cases the intra-abdominal pressure is great. After witnessing cases of rupture from vomiting, we can readily see how necessary it is to hold the line of incision as firmly as possible. Strong suturing sometimes gives way under the intra-abdominal pressure from vomiting or coughing. While I generally adopt the method advocated by Dr. Morris, I feel better if I have a strong suture in case there should be vomiting. This is a point we must consider.

DR. H. W. LONGYEAR, Detroit.—The proper closure of the abdominal incision is a matter largely of union of the aponeurosis. If you get union of the aponeurosis you will not have hernia. You may do this by the *en masse* suture or by the tier suture. If you leave things as nature put them before you severed them, you have done your duty.

Dr. Morris is right in regard to the fat. I formerly used the corkscrew arrangement that he speaks of, but recently I have eliminated the factor of the buried suture for both the skin and fat. I now use fine kangaroo tendon for the peritoneum and a heavier one for the fascia. For the skin I use the finest catgut, which rubs off at the end of nine days. There is no reason for sewing muscular tissue divided longitudinally; it is a detriment

to the parts, and in instances of long incision I fortify the kangaroo tendon with silver wire twisted, the twist being turned carefully under, so that it makes a round small button. It never causes irritation, and the union is thus more certain. If one does aseptic surgery and follows these rules, he will not have hernia. Most hernias come from drainage. The less we drain, the less hernias will result.

DR. JAMES F. BALDWIN, Columbus.—At the last meeting of the Ohio State Medical Society I read a paper on the same subject, in which I described a method which I have used for several years. My paper was based on over a thousand closures without known hernia. I spent considerable time in hunting up the records and trying to find out whether any hernias had occurred in the cases by corresponding with physicians. In that paper I discussed all the methods Dr. Ricketts has mentioned, and a number of others. I used through-and-through silkworm gut, for the reasons stated, catching, as he does, the edge of the peritoneum, going well back through the muscle and fat and out a little distance from the skin.

I do not use this method in fat patients, but in the ordinary subjects. Before doing that, as I go through the linea alba, I see that the sheaths of both recti muscles are opened, so that I get at muscular tissue directly. Then, after I have put the silkworm gut stitches in place, (and I introduce them from within out, threading the needle at each end to avoid carrying any possible microbes from the skin into the deeper structures), I take silk thread long enough to have a loop,—cotton will do just as well,—and close this over-and-over through the fascia. I thread into the end of my loop a piece of annealed iron, silver wire is not tough enough, pull it through, catching each turn of silk with my finger. It is brought out at each end of the incision through the skin in this way (illustrating), and after I have taken out the gauze compress I put underneath and smooth out the omentum, I take hold of each end of this and straighten it. The result is that by means of strong wire I bring the parts into apposition. If muscular tissue gets up at this point, I push it back, as I can see everything is in position. I close this, drawing it tight, thus bringing the parts together. When this is done, I have no spaces in which blood may accumulate, and do not have infection.

One must not be in too great a hurry to remove the stitches. Reference was made to taking out the stitches in five or ten days. I closed an abdominal incision in the case of a little girl where the stitches were removed in ten days. The nurse made a mistake in doing it, and the next morning the wound was gaping open. I had a similar case in which the stitches were removed at the end of ten days. Both cases did well after reclosure of the incision. I formerly used silver wire, but as you straighten it out it is liable to kink or it may break off and then the work must be done over. I do not believe in using silver wire and allowing it to stay in.

I think most of us have had to remove silver wire stitches after

they had been inserted by some of the Johns Hopkins men. After the wounds have healed beautifully and the patients had gone home feeling well, with silver wire in them, in one case at the end of six months, and in another after four years, I had to remove the silver wire.

I find that I cannot implicitly trust catgut, though it is safe when it is sterile. In fat patients I use it in closing these layers. I use the tier suture of catgut. Kangaroo tendon is too short to be convenient, and is not better than No. 1 chromicized catgut. Iron wire gives the best results.

Dr. Lewis S. McMurtry, Louisville.—In the consideration of this subject we do not need to confine ourselves entirely to suture material or the methods of suturing, but we should endeavor to get a clear idea of what it is we wish to attain, and then there may be various routes of attaining that end. Let me illustrate. Excellent results, as good as can be found anywhere, in closing the parietal incision by three operators in this country are obtained by entirely different suture materials. For example, Dr. Morris uses absorbable animal gut. Dr. Morris, as you all know, was a pioneer in this country in popularizing catgut, and he uses catgut exclusively for ligatures and sutures. He gets splendid results. Dr. Maurice H. Richardson, of Boston, who uses no catgut whatever, and rarely uses silkworm gut, closes his incisions with silk. He buries it, and he gets perfect results. Dr. Joseph Price, whose results you all know are equal to those of any surgeon, invariably uses through-and-through silkworm gut sutures, as advocated by the essayist. We have, then, three entirely different methods yielding, I believe, equally good results. I have seen the operative work of all three of these surgeons. After all all that has been said, there must be something more in this work than suturing. What do we wish to accomplish when we close the parietal incision? We wish to bring homogeneous structures in apposition and so retain them. We aim to bring peritoneum to peritoneum, fascia to fascia, fat to fat, and skin to skin. This can be done with these various sutures, whether it is done by the *en masse* suture or the layer-by-layer method.

In every case of hernia following an abdominal incision we will find that there was suppuration. It is very exceptional in any such cases that hernia is the result of the methods of suturing; if the homogeneous structures are brought into apposition and retained, they will unite; provided, of course, infection does not occur. What conduces to infection? Dead spaces, imperfect hemostasis, and, above all, imperfect aseptic methods. If we use either of the methods of suturing that have been described by the gentlemen this morning, and do it well and efficiently, we will get good results. We attain the same end by following different methods, particularly if we are careful in our asepsis, careful in cleansing the skin, in hemostasis, and do not strangulate tissue in tying.

So far as my methods are concerned, I am in the habit of using

in cases of simple section by preference, where I have a choice of methods, fine catgut, No. 00. Catgut should not be placed in the tissues with alcohol on it. It should be steeped momentarily in hot salt solution to cleanse it of the alcohol, and then it should not be handled by the nurse from the time it is taken out of the container and used in closing the incision. Indeed, it should not be handled by any person except the surgeon himself. I use the through-and-through suture frequently, and the results are equally good with both methods. In these discussions we devote too much attention and attach too much importance to the materials, and do not adequately consider the conditions which underlie the healing of wounds.

DR. WALTER B. DORSETT, Saint Louis.—I think Dr. McMurtry struck the keynote of this whole question—APPOSITION. It is not so much the particular method of through-and-through suture or the material that we use, but it is apposition. Yet he failed to state the best method of maintaining that apposition. I recognize the fact that the material must be absolutely aseptic, and if we are to use animal ligature, it must be as small as No. 3, or smaller, because any animal ligature larger than No. 3 cannot be sterilized.

There is one little point that was not touched on in the after-treatment and that is, in keeping up the apposition. The application of the zinc oxide plaster to the skin is not proper, for the reason it only draws together the skin. The skin slides over the muscle. The plaster does not draw together the muscular walls. I use through-and-through suture as employed by Dr. Price, and adopt the same method that has been illustrated. After the wound is closed, several gauze pads are applied over and to the sides of the incisions, and then a larger gauze pad is applied over this, which is attached to the skin by collodion. Again, over this, I fill up the space, after the pad is attached by the collodion, with other gauze pads, having first sprinkled boracic acid over the wound, for the purpose of drying up the secretions. As a consequence I do not have any hernias.

There is a good deal in the preparation of the patient. If the patient should vomit, it will disarrange the coaptation of the wound, so that there will be dead spaces after a time which did not occur at the time the edges of the wound were brought together. I prefer chloroform in cases of abdominal section. I prepare my patient in the following manner: If the patient is put on the operating table at nine o'clock, at seven o'clock she drinks one glass of water, at half-past seven another glass, and shortly before she is put on the table, she is given a third glass of water. Vomiting, whether from chloroform, or ether, is caused by swallowing the chloroform or ether. It is not uncommon to see a patient, when under the anesthetic, swallow a number of times. This anesthetic, whether chloroform or ether, produces irritation and, as a consequence, vomiting. If there is a moderate amount of water in the stomach, the chloroform or ether will be

absorbed by the water, and if she should vomit she gulps up the water she has taken into the stomach, and vomiting is stopped at that particular time and does not continue

DR. HAYD.—What is the temperature of the water?

DR. DORSETT.—Just the ordinary hydrant water. It is not necessary to give ice water.

DR. RICKETTS (closing the discussion).—In reply to my distinguished friend, Dr. Morris, who gave a little quotation, I wish to say that there are many roads which lead to Rome, but there is but one Appian way.

I would call attention to the point made by the last speaker, and that is, in those cases in which vomiting follows the closure of the abdominal incision, the patients are subjected to great risks by the contraction of the abdominal muscles. They are subjected to the great risk of hernia.

Dr. McMurtry has laid stress on a clean wound, and if that is not obtained, I care not what procedure you may use, the chances are the patient will run great risk of a resultant hernia. This is especially so after the use of the buried suture. If vomiting should occur in a patient in whom the tier method of suturing has been resorted to forty-eight hours after, when the catgut is supposed to be absorbed in so many hours, the patient is more liable to have a hernia than one on whom silkworm gut is used, which is not removed before the eighth or tenth day. In regard to the use of collodion or binder, or a bandage, it puts these patients in a better shape to guard against future hernia.

As I stated in my paper, the ideal method has not been attained. I want to call attention to the fact that Hans Kehr closes his abdominal incisions with buried silkworm gut, and the skin with horsehair. He closes the abdominal incision with through-and-through silk, and does not disturb the wound for about two weeks. I called attention to this in a discussion yesterday. It seems to everyone who is doing a great deal of work that the pendulum, in spite of all our efforts, is swinging back toward a material that has been used the longest, and that is silk. While I am not advocating it, the fact that it is so shows the tendency of the times.

I am under many obligations to the participants for the frank manner in which they have discussed this topic, but I am free to confess that the subject is not well settled as yet.

SUPRAVAGINAL AMPUTATION FOR FIBROID TUMORS.

By HERMAN E. HAYD, M.D.,
BUFFALO.

THE gradual development of the present operation of hysterectomy for fibroid is a very interesting study, and, like many other surgical procedures, it was stumbled upon, and then practised by different operators; and gradually, by a process of evolution, it has attained its present satisfactory and magnificent position. It was Dr. Ephraim McDowell, of Kentucky, who made hysterectomy possible when he performed his first successful ovariotomy in 1809. There was then created a necessity for the differential diagnosis of ovarian cyst and solid tumors of the uterus, because for a great many years ovariotomy was the only justifiable surgical undertaking; in fact, the abdomen was frequently opened under a mistaken diagnosis, and, finding a tumor of the uterus, the operation was abandoned, and the wound closed. The history of the development of this operation to the almost perfect technique of the present time, would be incomplete without first paying tribute to the early pioneers in this great branch of surgery, who, under the most disadvantageous circumstances, gave us practically the operation we are doing to-day.

To Clay, of Manchester, England; John Bellinger, of Boston; and to Burnham and Kimball, of Lowell, Massachusetts, we must give great praise. Kimball did the first successful hysterectomy on September 1, 1853, and made a correct diagnosis before the operation was undertaken. Burnham had operated successfully in June, 1853, but under a false diagnosis, having opened the abdomen for an ovarian tumor, and finding a fibroid uterus, removed it successfully. The operation they did was practically the operation we are advocating to-day, excepting that they left the lower end of the abdominal wound open to permit the escape of the long silk threads which were left attached to the stump of the tumor. With the accession of anesthesia, together with the triumphs of

modern surgery, the aseptic treatment of wounds and the employment of safe and absorbable ligature materials, refinements of technique have resulted, so that the crude operation of Kimball is now developed into one of scientific precision and exactitude.

Apart from the dangers of sepsis and those accidents which are always possible when operating in the vicinity of the viscera, hemorrhage was the chief anxiety on the part of the surgeon, when the stump was dropped back into the peritoneal cavity. Various devices were employed to meet this danger. Elastic ligatures were applied tight about the neck of the raw cervix, and left *in situ;* and finally the stump was pulled forwards, and in various ways was fastened to the lower end of the abdominal wound by different kinds of mechanical appliances; and thus the stump was treated extraperitoneally, so that any subsequent complication incident to it could be effectually controlled.

Koeberle, by means of his serre neud and the low mortality associated with his operation, gave a new impetus to abdominal hysterectomy; and his work was soon supplemented and popularized by the splendid results of many of his followers; and, chief among them, our own Joseph Price, who is to-day the greatest exponent of this method of removing the uterus for fibroid, and, strange as it may seem, about the only great surgeon, in this country at least, who still clings to that practice of disposing of the stump.

It is surprising to see how slow we have been to take advantage of the knowledge which anatomy gave us so many years ago. Men had dissected the broad ligament and mapped out with exactitude the blood supply of the uterus time and again; yet it was not until 1889 that any practical application was made of that knowledge. Dr. Stimson, of New York, revolutionized the whole field of uterine surgery when he demonstrated that by tying off the two uterine and the two ovarian arteries, complete hemostasis of the uterus could be accomplished. The broad ligaments are now tied off in sections, and the individual vessels are caught again separately, so as to make security doubly certain; and, finally, any little raw oozing surface is sewed over with a catgut suture. The uterus is deperitonized, anteriorly and posteriorly, and sufficient flap is taken so as to cover over the raw cervix after the uterine body with its tumor has been amputated. The vessels are tied with catgut, and the two folds of peritoneum are brought together by a running suture over the stump, and thus the peritoneal cavity is closed off, and an extraperitoneal disposition of the

stump is accomplished. And then the anterior abdominal wound is closed with perfect safety, and without subsequent anxiety.

Stimson's idea was taken advantage of by Baer, of Philadelphia, who reported, in 1892, nine successful supravaginal amputations for fibroid tumor without a death. He paid no attention to the os. It was neither sewed up nor treated with cautery or any species of disinfectant or caustic. The wisdom of his procedure has been borne out by the results of the bacteriological laboratory, which has shown us that the body of the uterus contains no infecting organisms, unless they have been introduced previously by violence and other forms of traumatism; and clinically we are all able to report uninterrupted convalescence and recoveries after all kinds of complicated supravaginal operations, without paying any attention to possible infection from without through the open os. In fact, most of us believe that all means directed to disinfecting the canal are quite unnecessary, and are apt to invite infection and subsequent formation of pus.

So far as any other measures are concerned for the cure of fibroids, they are simply to be condemned. Electricity once promised so much, but the dangers associated with its employment, even in careful hands, are as great as operation would be under the same favorable circumstances.

So with ligation of the uterine arteries, the benefit is so transitory and so uncertain that this procedure should never be undertaken, at all events only under the rarest circumstances.

The operation for the removal of the ovaries to stop the further development of the fibroid is too uncertain. Years ago, when the dangers of hysterectomy were so great, such makeshifts were permissible, but hardly now, although there is no doubt that complete removal of the ovaries and tubes has caused diminution in the size of the tumor and a cure of the painful and dangerous symptoms, especially the hemorrhage. Therefore, in certain cases, where the element of time is great, and where the dangers of chloroform become manifest and the life of the patient is in great risk, we can be content to quickly remove, thoroughly and completely, both tubes and ovaries, with the expectation, although not with certainty, of relief and possible cure.

Supravaginal amputation has such a small mortality, not more than 5 to 6 per cent., with all kinds of cases, complicated as they so often are with hydro-, hemato- or pyosalpinx, that we can in good faith to ourselves and our patients' welfare recommend it when once we are satisfied that the tumor is progressing in size

and its symptoms are demanding active treatment. I am, however, of the opinion that over-conservatism is even more dangerous than extreme radical surgery, as we see, every day, patients depleted from frequent floodings, and die of some simple intercurrent disease, because self-resistance was reduced to a minimum, or pressure symptoms were left unrelieved until dangerous complications were excited in bladder, ureters and kidneys.

Again, the menopause, which often brings about an abatement of the symptoms, and the tumor even shrinks in size, has its dangers, because it is at this time that various forms of degeneration set in, sphacelation and necrosis, abscess, and even malignancy. Dr. Noble, of Philadelphia, has written a great deal on this interesting subject, and I have taken much of this paper from his work. He reported two cases of fibroid; one in a woman of seventy and another in a woman of sixty-seven, which had been dormant for years, suddenly undergo degenerative changes; and the formation of pus and death resulted in an effort to give relief. However, every uterus need not be removed because it contains a fibroid, even if of large size, when it produces no special symptoms. Nor does the presence of a myomatous tumor, even in a pregnant uterus, necessarily demand operative interference, as many of these women go on to term and through delivery without any trouble, because the tumor is often lifted up in the growth and development of the uterus, and thus offers no impediment whatsoever to the incoming head and its expulsion. Nor should every uterus with a fibroid be sacrificed when it becomes pregnant, as conservative operations can be often done upon them without causing premature labor or abortion.

In a paper written by Emmet, in the *American Gynecological and Surgical Journal,* June, 1900, he reports nine cases where myomectomy was performed on the pregnant uterus without inflicting any injury, and without causing premature expulsion of the ovum. When the tumor is situated low down in the pelvic outlet, and will of necessity be an obstruction to delivery, it should be removed early; but the exigencies of each case must be carefully considered, and the best route employed with safety to the mother first and her progeny secondarily, having in view, however, always the possibility of a later operation when the child is viable, or a Cesarean section at term.

The only other operations I have employed for the removal of the uterus for fibroid tumors is complete hysterectomy, or panhysterectomy, abdominal and vaginal. To my mind, the opera-

NO.	DATE	AGE AND NAME	CHARACTER OF TUMOR	SYMPTOMS	OPERATION	REMARKS	RESULT
1	Feb. 7, 1900	33 Mrs. K.	Very large hard intramural fibroid; few adhesions. Very short pedicle	Great pain in back and down legs	Supravaginal hysterectomy		Cure
2	Jan. 10, 1900	42 Mrs. G.	Large fibrocystic soft tumor, size of baby's head, extending into broad ligament, and mistaken for intraligamentary cyst. Complicated with large ovarian cyst size of football. Dense adhesions	Pain and inability to get about, and hemorrhage	Supravaginal hysterectomy after first tying off ovarian cyst		Cure
3	March 21, 1900	46 Mrs. C.	Large myocystoma of right and posterior side of uterus; felt like intraligamentary cyst	Great pain in right side, and hemorrhage and difficulty in locomotion	Supravaginal hysterectomy		Cure
4	Nov. 21, 1900	46 Mrs. W.	Large pedunculated fibroid from posterior and lower part of uterus, and filling up whole pelvis	Pain and inability to get about. For years a terrible sufferer. Bowel and bladder distress	Removed fibroid by myomectomy; bleeding was so active uterus was then amputated supravaginally, and in it were found smaller fibroids		Cure
5	Nov. 30, 1900	29 Mrs. T.	Hard fibroid extending into right broad ligament, larger than one's fist; and smaller nodules size of potato on fundus. General adhesions. Operation very difficult	Great pain in back and sciatica. Was rapidly becoming a morphine habitué	Supravaginal amputation	August 28, 1898, I removed a left ovarian cystoma from this patient. At that time a small fibroid, no larger than an olive, could be felt on right side of uterus between folds of broad ligament. Another, not the size of a pea was seen on top of uterus. These subsequently grew to size seen at operation	Cure

6	Jan. 12, 1901	36 Mrs. M.	Hard intramural fibroid size of two fists, and adherent cystic ovaries. Tubes closed	Great pain and tenderness, and constant distress in lower part of abdomen	Supravaginal amputation		Cure
7	March 1, 1901	40 Mrs. B.	Large intramural fibroid growing into uterine cavity without pedicle, and delivered with great difficulty	Hemorrhage and pain; for years a great sufferer; very marked anemia	Supravaginal amputation	In this case the abdominal wall was sutured in layers with chromicized catgut. On the 11th day patient wanted the bedpan, and nurse could not go to her at once. She jumped up and broke abdominal wound. I found her two hours afterwards with some of the coils of small bowel protruding through wound. The wound was opened under chloroform, and again sewed together with through-and-through sutures. Since this case I have never relied on layer sutures alone in long incisions.	Cure, and no rupture to this day
8	July 2, 1901	36 Mrs. Z.	Large saccular fibro-cystic tumor, nodular, and filling up cul-de-sac, and bound down by dense adhesions. Large hydro-salpinx of left tube, and right ovary size of fist. Cyst	Pain, hemorrhage and progressing emaciation	Supravaginal hysterectomy		Cure
9	April 29, 1902	36 Miss Q.	Large intramural fibroid, reaching to navel. Delivered with difficulty. Incison carried above navel	Patient nearly exsanguinated from loss of blood	Supravaginal hysterectomy		Cure

NO.	DATE	AGE AND NAME	CHARACTER OF TUMOR	SYMPTOMS	OPERATION	REMARKS	RESULT
10	May 30, 1902	47 Mrs. L.	Large intramural growing posteriorly	Great pain in back and legs and inability to get about	Supravaginal hysterectomy		Cure
11	Dec. 4, 1902	36 Mrs. B.	Large intramural filling lower abdomen, cystic and growing rapidly	Great pain and severe hemorrhages; very anemic	Supravaginal hysterectomy		Cure
12	April 9, 1903	32 Mrs. J.	Large multinodular fibroid. One large nodule was wedged into and filled up the whole pelvis, and pushed the cervix up against the bladder, so that the nurse could not pass a soft catheter into the bladder. There were a number of other nodules, from the size of a walnut to that of an egg and pushed well into the broad ligaments. The ovaries were much enlarged and so adherent that they were removed with the tumor. The tubes were very adherent and deep in the pelvis. They were delivered and tied off separately	Great pain and inability to walk or get about; even riding on the cars caused great suffering; great difficulty in making water and bladder always contained residual urine; constipated bowels and bleeding piles—in fact the woman came to me for an operation for piles	Supravaginal amputation	In dividing off the anterior peritoneum low down I tore a small hole into the bladder. It was carefully sewed up. Operation was very difficult. Post mortem refused. Undertaker said he removed some urine-smelling fluid from peritoneal cavity when embalming body	Died on 3d day of septic peritonitis
13	April 29, 1903	40 Mrs. G.	Large intramural myoma. Uterus extended above navel	Pain and bleeding	Supravaginal hysterectomy		Cure
14	Aug. 26, 1903	38 Mrs. G.	Multinodular fibroid, one size of orange from anterior and right lateral surface of uterus, and a number of small nodules all over uterus	Pain and bleeding and irritability of bladder	Supravaginal hysterectomy		Cure

tion of total hysterectomy offers very few advantages. It is more difficult to perform, has a higher mortality, takes more time, and has increased dangers from hemorrhage, and it robs the vault of the vagina of the support which the cervix gives it. However, in certain cases it should be the operation of election, when the cervix is the seat of marked cystic degeneration, or has a bad tear, and particularly if associated with considerable vaginal prolapse, or where, for any reason, drainage would be desirable.

The only case I lost of the group I am presenting in this paper was one I operated on April 9, 1903. It was an exceedingly difficult operation—a large multinodular fibroid, with its longest dimension placed anteroposteriorly in the pelvis, and wedged into the hollow of the sacrum so that it was extricated with great difficulty; and it pushed the bladder so far up and forward that the nurse could not pass a catheter into the bladder so as to empty it—our custom before such operations are undertaken. After the operation I drew off nearly a pint of urine with a metal catheter, and no doubt a large portion of this had been residual urine in a sacculated bladder. In separating the bladder, I tore a small hole into the viscus, low down and posteriorly, which I quickly and carefully sewed up. I felt reasonably certain that it would hold; but evidently it did not, because the patient died on the third day, and the undertaker told me that when he used the trocar for embalming purposes, a urinous-smelling fluid came out of the peritoneal cavity. A post-mortem examination was denied us. Had I done a complete hysterectomy and left the vagina open, and provided a gauze drain, I feel confident that my patient would have made a satisfactory recovery.

Statistics are worth something, and, although we often juggle with them to suit our individual preferences, they, nevertheless, represent a standard of work which must be taken for our guidance, and by which we must estimate the gravity and dangers of all operations. The mortality of supravaginal amputation, according to Noble's table, is 5.6 per cent., while that of total extirpation, in the hands of just as good a group of men, is 9.6 per cent. The work of individual men, even with the serre neud operation, is, of course, infinitely better than these figures indicate, but it would also be so if they did the supravaginal amputation and dropped the stump back into the peritoneal cavity. The suffering of patients is less, their period of confinement shorter, the dangers of subsequent hernia are reduced to the minimum, and a more beautiful abdominal scar results, and less danger of subsequent adhe-

sions of bowel and viscera to the abdominal incision, with the future possibility of operation for strangulation and obstruction, and infinitely less wear and tear and labor for operator, assistants and nurses.

In this paper I could have gone into a discussion of the field for myomectomy and the questions concerned in the advantages of the vaginal over the abdominal route for certain fibroid polyps and small tumors of the uterus, but have been content to place myself on record as believing that the supravaginal amputation for necessarily operable fibroids meets nearly every indication demanded of the abdominal surgeon, and can be applied, and has been applied, to every conceivable kind of tumor, with short pedicle or long pedicle, tumors growing deep into the pelvis, or out into the broad ligaments; and with results which make it a clean and ideal piece of surgery, and is the operation of choice, excepting in those cases where drainage must be provided for, or where the cervix, for various other reasons, should be removed.

I append herewith a table giving a list of my supravaginal amputations, fourteen in number, with one death. The operation by preference I performed is that given us by Baer, and modified occasionally after the suggestions of Kelly and other more recent operators, when some special indication seemed to exist for their employment.

DISCUSSION.

DR. D. TOD GILLIAM, Columbus.—In the scant time at our disposal, I merely wish to say a word in regard to this excellent paper. I understood Dr. Hayd to say, that it makes little difference, in his opinion, whether we stitch up the cervix afterward or leave it as Baer did, perfectly raw. I started to do this work on the principle of Baer's operation. I heard him describe his method at a meeting of the American Medical Association, in Detroit, and also I talked with him about it. I went home and tried it, and found that I had a mortality that was too great. I then began to stitch up the cervix, carefully cleansing the vagina, because the cervical canal sometimes contains pathogenic germs. If the cervical canal is germ free, there may be, and usually are, germs in the vagina of various kinds, many of them pathogenic. Hence now I always thoroughly cleanse the vagina before these operations and stitch over the cervix. If there is oozing from any raw surface, the germs will find their way to it through the cervical canal. Since I have been stitching up the cervix with three or four transverse sutures, after thoroughly cleansing the

vagina, my mortality has been reduced to a reasonably low rate, hence I naturally adhere to this technic.

DR. ALBERT GOLDSPOHN, Chicago.—I cannot agree with the essayist that it takes more time, or that it is much more difficult to remove the cervix than it is to take out the entire uterus. In the majority of cases the indications are to that effect. Unless we deal with quite young women, who have much to live for and domestic duties before them, the dangers of malignant changes taking place in the remaining cervix would not be of great significance, because the period of life up to the time when malignancy occurs is of greater moment. In women who are thirty or thirty-five years of age, it would be a neglected duty not to remove the cervix in the class of cases under discussion.

When we consider the technic of Doyen, we can modify it to suit ourselves. There is no great difficulty attending the removal of the cervix, and as to losing the arch of the vagina, that is more talk than fact. It is important, as Dr. Gilliam has suggested, to cleanse the vagina in these cases beforehand; and also, oftentimes the cervical canal. One assistant can do that while another is cleaning the abdomen.

DR. H. W. LONGYEAR, Detroit.—I wish to commend the views of the essayist in regard to the conservation of tissue. If the uterus is healthy below the tumor, we should endeavor to leave it. I believe it is wrong to take it out if it is not diseased. We should always preserve tissues that are healthy.

DR. LEWIS S. MCMURTRY, Louisville.—I was very much interested in Dr. Hayd's beautiful sketch of the history of this operation. It is a very instructive description. This operation stands to-day one of the greatest triumphs of modern surgery. When we consider what a short time has elapsed since it was regarded as among the opprobria of surgery, and that it has now been placed upon such a basis as to rank alongside of ovariotomy, which we have for years proudly cited as the most successful major operation known to surgery, it is a matter of congratulation.

Coming down to the practical considerations of the subject, there are a few points, some of which have been mentioned in the discussion already, that deserve attention. Dr. Gilliam touched upon a very important one, and I am sorry he did not take the time to elaborate it a little more. I will endeavor to accentuate it by drawing on my own experience in the early practice of this operation, which doubtless has been similar to that of others. After a supravaginal amputation, with dropped pedicle postperitoneally, the patient's convalescence seemed ideal for a few days, then there was a rise in temperature, a phlegmon would form about the pedicle and discharge into the vagina. This condition latterly has been eliminated, and it has been along the line Dr. Gilliam suggested of paying a little more attention to details than was done in the early operation.

The placing of many ligatures about the cervix complicates the

condition. Placing large silk ligatures around the arteries caused phlegmon, the ligatures became infected, and in a number of cases there were abscesses working along subperitoneally, and pointing at the lower angle of the abdominal incision as the result of the infection. In the early days of the operation it was suggested to take a small scalpel and cut out the mucous membrane of the cervical canal, and then pass a wisp of gauze through the cervical canal into the vagina, so as to drain the dead space that was left around the cervix. The peritoneum has been very much altered in its relations by the operation; we amputate the cervix, make peritoneal flaps fore and aft, drop the cervix behind, and stitch the peritoneum over the top of it. This invites effusion of serum and perhaps blood around the cervix, communicating with the cervical canal and vagina, which is often an infected area. The suggestion was made to drain this accumulation. This was done, and it improved the results. But we found later, by continuous work and by exchanging ideas in associations like this, that it was very essential to do the suturing carefully, having the cervical canal properly cleansed beforehand. For example, the preparation of the patient immediately before the operation is begun ought to consist in cleansing the vagina and cervix just as if one were going to do vaginal hysterectomy. After the tumor is amputated and the cervix closed, the operator should see to it that hemostasis is perfect, that there are no oozing points left to make a pool of blood and serum underneath the peritoneum, that the flaps are properly adjusted, and thus prevent suppuration about the pedicle.

In one of my cases cancer of the cervical stump occurred three years after a complete recovery from the operation, and from which the patient lost her life. I do not believe that such a sequel is sufficiently frequent to give preference to panhysterectomy with its increased mortality.

Dr. James F. Baldwin, Columbus.—There is one practical point I have utilized in this operation, and I have made three hundred of them, that has not been mentioned, but which I think deserves some notice. One objection to hysterectomy is the danger of shortening the vagina. This applies more especially to panhysterectomy than to supravaginal hysterectomy. To obviate this, I make good strong flaps on each side of the cervix, so that the ligaments drop in between the flaps, if the woman is a multipara. Dr. Kelly, who was at one of my clinics, and saw two operations, expressed himself as delighted with the maneuver. There have been two cases of hernia of the vagina from not resorting to such a procedure. I have had two cases of cancer of the cervix following this operation. In one patient in whom the disease returned four years ago, I removed the cervix with the vagina, and unless she has had a recurrence, to-day she is entirely well. Another case died without operation.

Ochsner, in his recent textbook, calls attention in several places to the danger of gangrene of the stump from the use of ligatures. I have never had that happen, and I think it has been greatly

exaggerated by him. After closing the stump, as mentioned by Dr. Gilliam, with No. 1 chromicized catgut, I close the peritoneum over it in order to avoid a collection of blood between the peritoneum and top of the stump. If there is any accumulation, it will escape into the peritoneal cavity and be taken care of.

DR. HAYD (closing the discussion).—I am sorry I cannot agree with the various gentlemen who have endeavored to persuade me that the cervix requires attention. It is not a source of infection. We know its mucous membrane is not especially pathologic, but on account of the lymphatic arrangement which exists in the upper part of the vagina, injuries and traumatism of the cervix may bring on phlegmons or a lymphangitis, to which attention has been called, and for that reason it should be left alone. Now, I do not believe it is necessary to pay any attention whatsoever to the cervical canal. Of course, I always wash out the vagina. I would not think of making such an operation without doing so, because one may find a pus tube or have an injury to the bowel, or a hole in the bladder, to contend with. It is possible also, to find a dermoid or an appendicitis, in which case it is necessary to drain, but in such conditions a panhysterectomy would be done because drainage is desired.

In regard to cancer attacking the cervices that have been left, I believe it does so rarely; however, there is no question that statistics represent something, and in the hands of good operators on the one side, with equally good ones on the other, there is a mortality of 9.6 per cent. attending panhysterectomy, as compared with 4 per cent in the simple operation of supravaginal hysterectomy. It seems to me absurd for us to argue that it would be less dangerous to remove the cervix than to leave it. It takes more time. You are operating in the vicinity of the bladder and rectum; you are operating in close proximity to the ureters; you have a hemorrhage that follows from the upper portion of the vaginal mucous membrane at its junction with the cervix. It is not a question of conservation of tissue, which Dr. Longyear alluded to, but one of mortality that prompts me to leave it. It is the element of time in getting through quickly and saving the patient. As I stated in my paper, if the cervix suggests degenerative changes, if there is an old laceration, it should be removed. We do not use silk in any of these operations, consequently the troubles we formerly had because of silk have disappeared.

With reference to dead spaces, spoken of by Dr. McMurtry, if one is careful to tie the uterine arteries properly, and if he makes a little extra pressure on the raw cervix, he will prevent any oozing and thus do away with the space. He has practically a dry cavity, and what little blood may exude into it is absorbed immediately. Moreover, I have little faith in gauze of any description as a drain; indeed, I think it practically becomes a plug in the course of twelve or fourteen hours. I leave in it an opening to take care of later complications that may require an exit.

OVARIAN GRAFTING.

By ROBERT T. MORRIS, M.D.,
NEW YORK.

THE experimental work upon which I wish to make a report at this meeting was interfered with by an accident to one of my series of rabbits, and I will simply give a brief resume of our information to date on the subject of grafting ovaries.

(1) When the ovaries are removed from an animal, and then replaced at some point near their original site, or even at distant points, the tendency is for the ovary to continue its functions of developing ova and of furnishing its internal secretion. Such transplanted ovaries may continue to do normal work for an indefinite period.

(2) When ovaries are removed from one animal, and transplanted into another animal of the same kind which has had the ovaries removed, the tendency is for the grafted ovary to undergo a degenerative process. The graft will continue to furnish ova and internal secretion for several months in some cases, but at the end of a year we often find the grafts fatty and apparently useless. We assume that the serum of one animal is destructive to the introduced tissues of another animal of the same sort. My present line of investigation is toward making one series of rabbits immune against the serum of another series, and then exchanging the ovaries of the two series. If this can be accomplished ovarian grafting will be placed upon a plane of usefulness much above its present one.

We have, however, arrived at several points of practical value, and that may be applied in our work to-day. If, for instance, in a case of pyosalpinx we are obliged to remove the ovaries and oviducts *en masse,* as often occurs, we can place part of a fairly good ovary in warm saline solution until the rest of the work is completed, and then graft this piece of ovary partly beneath the peritoneum at some point near its original site, before closing the abdomen. The ovarian graft will be the means of preventing a

precipitate menopause, the patient will continue to menstruate, and there is a possibility of pregnancy occurring if the stumps of the oviducts remain patent, as they commonly do after absorption of catgut ligatures. This refers chiefly to grafting in a piece of the patient's own ovary. If she receives a graft from another patient, operated upon at the same time for the purpose, the patient may continue to menstruate for some months, and to have the benefit of internal ovarian secretion. It may even be possible for her to become pregnant, before the graft has degenerated, but this has occurred as yet only in rabbits, and very shortly after the grafts were introduced. The degeneration of ovary grafted from one patient into another is as yet so certain to occur, that the procedure has little practical value. Incidentally it may be of interest to know that we have restored the function of menstruation in patients who have lost their ovaries, for various periods of time, up to two years after the loss of the ovaries. Menstruation, however, continued for a few months only, and then disappeared with the disappearance of the integrity of the tissues of the graft. In one patient who had congenital absence of the uterine adnexa and who had never menstruated, menstruation was established by ovarian grafting, and continued nearly four years. These facts are contributory to an interesting mass of data that we shall eventually group together for scientific classification, but to-day I wish simply to impress the idea that we are to graft back a part of a woman's ovary whenever this can be done safely, in cases in which the loss of all ovarian tissue would be a misfortune. The method that I employ consists in putting a piece of one ovary into a pan of saline solution at a temperature of about 100° Fahr., and detailing a nurse to keep the water at this temperature until the rest of the intra-abdominal work is completed. The segment of ovary is then inserted through a slit in the peritoneum, somewhere near its original site, and in such a way that raw surface of ovary is subperitoneal, where it can be nourished by the lymph circulation until new capillaries have formed for its support. New blood vessels are formed about the graft so rapidly that I have been surprised at their size and abundance at the end of two months in rabbits. A part of the normal periphery of the ovary is allowed to protrude into the peritoneal cavity, so that ova may escape and find their way into the oviducts in cases in which such a possibility exists. One or two sutures of fine catgut serve to hold the graft in place. The facts which are at present grouped about the

subject of ovarian grafting will have a tendency to make us more conservative in the wav of sparing many uteri that would otherwise be removed by advocates of panhysterectomy.

DISCUSSION.

DR. GILLIAM.—I would like to ask Dr. Morris what kind of suture he uses in ovarian grafting.

DR. MORRIS.—I use the very smallest, No. 1 catgut.

DR. JOHN B. MURPHY, Chicago.—I would like to know how Dr. Morris implants this kind of ovary. In January or February of this year, I removed an ovary with a fibroid tumor and transplanted the ovary into a Reis monkey. I split the ovary, transplanted half of it subperitoneally and the remaining half intraperitoneally. I removed it thirty-two days afterward and sent it to the pathologist, without any statement as to what had been done, asking him for an opinion as to the condition of the ovary. He reported that the ovary was absolutely normal in every respect.

DR. HERMAN E. HAYD, Buffalo.—Will the process of ovulation and menstruation go on whether an ovary be transplanted intraperitoneally or extraperitoneally? If so, there will be infinitely less danger if the piece of ovary is transplanted into the abdominal wall; in other words, one need not then worry as much about his technic as when he plants the ovary in the peritoneal cavity.

DR. MURPHY.—The transplantation of an ovary intraperitoneally is fatal to the ovary. I would like to ask Dr. Morris what he did, as it is well known that the peritoneum digests rapidly every animal tissue brought in contact with it.

DR. ALBERT GOLDSPOHN, Chicago.—I have not utilized ovarian tissue that has been completely severed from its original connection, fearing that this might seriously interfere with its function. That ovarian tissue will do good otherwise, so far as continuing its secretory function is concerned, is proven by experiments made by a German whose name I have forgotten for the moment. I recall now two cases in which the ovarian remnants were practically thought actually severed from the body and were used. In one case, there was only the slight vestige of an ovary. It looked like a mass of denuded entirely raw tissue, although there was ovarian tissue in it. The remnant barely remained connected by a little bit of connective tissue. In another instance there was merely a small vein left to serve as a connecting medium. In both cases I swung the ovary around to the nearest accessible healthy peritoneal surface, upon or near the uterus, and stitched it there with fine catgut. Both of the women menstruated within two months after abdominal section and they have done so regu-

larly since. They are enjoying good health and claim not to be lacking in sexual appetite.

DR. JAMES F. BALDWIN, Columbus.—If we are making a transplantation of an ovary for the purpose of preventing the ill effects of the menopause and not with the idea of future pregnancy, this being of minor importance, why may we not, in a patient who has been operated on several months before, make an incision down to the peritoneum: that is, make a little pocket, and drop in the healthy ovary from patient No. 2 and then close the incision? Frequently an ovary has been embedded in the densest adhesions in the pelvis, yet the woman has gone on menstruating, but has not conceived. It seems to me entirely faulty to suppose that the ovaries can have nothing to do with the peritoneal cavity, except as pertains to pregnancy; and to exclude the idea of its continuing its function by preventing the menopause and abridging nervous symptoms.

DR. MORRIS (closing the discussion).—An ovary that has been grafted into the same patient may be found perfectly normal at the end of thirty-one days, at the end of ninety days, or even at the end of six months or six years. On the other hand, an ovary that has been grafted from one patient into another will probably not be found to be normal at the end of that period. In a series of rabbits operated upon over a year ago, in every one we found ovarian tissue at the end of twelve months. We found the ovary still perfectly normal when the rabbits were grafted with pieces of their own ovaries. The corpus luteum is an organ which has a special function. It controls menstruation. So long as a corpus luteum is formed in a grafted ovary the patient will menstruate. When a corpus luteum is not developed then the patient ceases to menstruate.

It is necessary to get lymph circulation in order to keep the ovary alive. Were it not for this lymph circulation the ovary would become absorbed, because the peritoneum will digest beefsteak. The ovary, therefore, must receive a lymph supply. In a few days we found capillaries and a complete ovarian circulation. I have seen pretty good sized arteries surrounding a grafted ovary, but not actually in it. We have not noticed infection in any of the rabbits experimented on.

As to the point of bringing back menstruation after it has disappeared, I will mention the case of a nurse who had had her ovaries removed two years previously. She had ceased menstruating. We brought back menstruation in her case, so that she menstruated regularly for several months. One young woman with an infantile uterus, after receiving an ovarian graft, menstruated for four years. The graft then became absorbed, since which time she has ceased menstruating. This is a new line of work, and while there may be disappointments connected with it, practical points are being brought out that are going to become of great value.

DR. BALDWIN.—In operating on a woman who has not been

menstruating for two or three years, is it necessary to implant any part of the ovary into the peritoneal cavity? Why can you not slip it into a pocket made underneath the peritoneum?

DR. MORRIS.—You can slip it under the skin and it will carry on its function. If you put a piece of thyroid gland anywhere, so long as it is in the tissues, it will carry on function. It undergoes absorption more rapidly if it is implanted in tissue distinctly foreign to its normal surroundings. But if it is surrounded by an environment practically normal, it retains its integrity for a much longer period of time.

THE PELVIC MUSCULATURE IN DISEASE.

By HUGO O. PANTZER, M.D.,
INDIANAPOLIS.

THE observant gynecologist can see no occasion for the contention between anatomists over the presence or nonpresence of smooth muscle fiber in the connective tissue of the pelvis. His daily clinical observation affirms the finding of Savage, who describes unstriped muscle fiber everywhere in the pelvic subperitoneal tissue, and names it the pelvic platysma; and of Luschka, who designates the extensive collection of such fibre in the sacro-uterine ligaments as the retractores uteri. Then, there is the free distribution of unstriped muscle tissue chiefly along the courses of the base and upper margin of the broad ligaments, in the round ligaments, cystic ligaments, and in the vaginal wall; and the large striped muscles of the pelvis, notably the pelvic outlet. Here is an array of muscular tissue, subject to the same laws of irritation that govern this tissue elsewhere in the body. Its contraction *in toto* or in part, here or there, varying with the morbid stimulus, it may be supposed, gives rise to phenomena varying as to location and degree, and which should be found helpful in differential diagnosis. The surgeon in the simple cases of bone fracture and dislocation has ascertained definite differential relations between such injuries and the contraction of related muscles. The abdominal surgeon has learned to attach special importance to the active and even spastic contraction of the abdominal muscles. As a matter of fact, the expert gynecologist makes differential distinctions by such muscular evidence. This conviction expresses itself most forcibly where complete anesthesia is required for diagnosis, which effectively annuls muscular rigidity and spasm. The skill of the gynecologist often circumvents this necessity by favorable posture of the patient during examination, by engaging the mind of the patient, and most of all by the gentle and subtle application of the vaginal, rectal, or abdominal touch. Those engaged in this speciality often find that what at first touch appears to be a board-like infiltration of a part,

or of all the pelvic tissues, and which resembles neoplasm or inflammatory condition, under further observation reveals itself to be simply an affection of the ovary. Thus an abscess, prolapse or conjugal trauma of the ovary, or its acute congestion owing to spinal reflex, may be the sole pathology found. A circumscribed disease of the tube or uterus, or circumscribed diffuse inflammation or ulcer of the vagina, rectum, bladder, urethra, or ureter, may create similar irritative contractions of the different parts of the pelvic musculature.

By contrast, the perusal of different works on gynecology shows them remarkably inexplicit, or even silent, on the subject of the muscular phenomena in pelvic disease. Winter's most excellent book, *Gynaekologische Diagnostik,* Leipzig, 1896, fails to mention it. The short chapter on pelvic anatomy in most text-books on gynecology says nothing about the unstriped muscular tissue; or where it is mentioned, yet no reference is had to its clinical bearing. One author, who writes the part on pelvic anatomy in a large work by different authors, gives a most admirable description of the smooth muscle tissue as found by different investigators. Incidentally he refers to the clinical bearing it may have. He specifically mentions the retractores uteri of Luschka, stating that their contraction produces anteflexion of the uterus. But the same author in his own complete treatise of gynecology fails to mention this subject. The writer has selected two cases, showing extreme degrees of contraction of the pelvic musculature.

CASE I.—Mrs. H., age 38, living in illegitimate wedlock, has suffered dysmenorrhea for many years. While menstruating she attempted to move heavy furniture. She felt something give way then. Sharp intermittent pains had lasted three days when she was admitted to the City Hospital in July, 1903, where she came under observation. No temperature; increased pulse frequency. Examination revealed the levatores et sphincteres ani tensely contracted. This condition was the more striking because of the slight adipose tissue. Vaginal and rectal touch revealed a noninflammatory swelling irregularly round, crepitant under pressure, distending the entire left broad ligament. The base of the left broad ligament and the sacrouterine ligaments were painfully tender and contracted, fixing the uterus in these directions. The right broad ligament was comparatively relaxed and nontender.

Diagnosis.—Progressive hemorrhage into the left broad ligament. Various treatment with rest in bed failed to check the

hemorrhage. The pains continued intermittingly and traveled to the other side of the pelvis. Examination revealed the concurrent progression of the swelling in the same direction. While the extravasation passed by the cervix, there was much bladder irritability. Both broad ligaments became distended before the pain and tumefaction ceased. The pain clearly appeared where the blood dissected the peritoneum from the underlying tissue. The entire pelvic musculature at one time or other was more or less tensely contracted during the prevalence of the hemorrhage and pain. Evidently nature had attempted to splint the part by spastic contraction of the adjacent muscles. Since, the writer has had repeated occasion to observe similar phenomena in other cases. The contraction of the muscles of the outlet as a symptom of pelvic hematoma, as compared with its absence where the hemorrhage is into the free abdominal cavity, seems to the writer an observation of diagnostic value. He has failed to find record of similar observation.

CASE II.—Mrs. B., age 29, a farmer's wife of stout stature, was seized suddenly at night with sharp and colicky pains in the lower abdomen and vomiting. She associated the attack with a heavy meal of fried liver taken in the early evening. She had had her flow the previous week, and during its prevalence she attempted to put a bucket of coal into a base burner. She had pain develop in her lower abdomen, and had not felt well there since. The reappearance, out of time, of the vaginal discharge at the time of the last attack suggested the possibility of a relation between the two. Her family attandant called on the evening of the second day. He found a rigid right half of the abdomen, distended and tender over McBurney's point. Temperature 102°; pulse 120; pain through different parts of the abdomen. Patient next morning was seen with counsel. She had had a restless night and had tossed much. Pain greater in right inguinal region. Diffuse swelling and tenderness through entire abdomen. Parietes rigid. Temperature 103°; pulse 130, weak. Patient anxious and restless; vomiting since morning.

Diagnosis.—Appendicitis and diffuse peritonitis. I saw patient late that night. Patient now had temperature of 98°; variable pulse, 120-140; rapid costal breathing; dyspnea. The pain through the abdomen was absent. Patient, however, complained of pain in the pelvis. Abdomen soft, very little distended; shows slight indefinite tumefaction in right inguinal region. Vomiting without effort, at longer intervals, of watery substance. Extremities cool,

abnormally moist. Sensorium bright; slight suggestion of euphoria. Pelvic examination revealed rigid, very painful, thickened bases of both broad and sacropelvic ligaments. Slight bloody discharge from uterus. There was no evidence of peritonitis and the conditions indicating appendicitis were slight and indefinite. The pelvic finding indicated an acute severe noninflammatory infection. The pulse and spastic contraction of the pelvic floor seemed to indicate there might be acute pelvic congestion or hemorrhage. Appendicitis, if at all present, was seemingly on the decline, and its significance waned before the acute grave conditions presented by the pelvic organs. A nurse had been telegraphed for and was expected to arrive in a few hours. Pending her arrival definite decision was deferred a few hours. Early the next morning the patient was found weaker; pulse 140-160, variable, bad; vomiting more frequent and grumous. Temperature 102.5°; some delirium. Abdomen flat. There was increased tumefaction and dulness in the right inguinal region. Patient complained no more of pain in pelvis. Vaginal examination revealed rigidity entirely absent, and there was no tenderness on pressure. Womb and ligaments were naturally movable and relaxed. Patient evidently was moribund from gangrenous sepsis.

Diagnosis.—Gangrenous appendicitis with extensive suppuration. The operation revealed pus in right inguinal region.

The writer would construe that the subsidence of the rigidity of the abdominal muscles observed in the morning occurred because of the progressive spread of the gangrenous sepsis. In turn nature attempted to fixate the muscular tissue of the next wider zone. Thus arose the violent and painful spasm of the pelvic floor, and judging from the costal breathing involved also the diaphragm. Later, on the following morning, the concentric growth of the gangrenous invasion had broken down this muscular wall—the last barrier nature was able to put up.

In conclusion, the writer is aware that this presentation of the subject does not merit the name of a thesis. He hopes, however, that the observations recorded may be found of interest. As such, he would submit them respectfully for critical consideration.

VERATRUM VIRIDE IN SURGICAL AND OBSTETRICAL PRACTICE.

By CHARLES L. BONIFIELD, M.D.,
CINCINNATI.

In spite of all the knowledge of infection which the profession has acquired in the last quarter of a century from the laboratory work of the bacteriologist and the operating room and bedside observations of the practitioner, sepsis still claims many victims from the surgeon and a few from the obstetrician. Modern surgeons have bent all their energies to the prophylaxis of the disease. By the perfection of their aseptic technique, they have striven to prevent it, and left the treatment pretty much where they found it. The only change in treatment which has been generally accepted is the withholding of opium and free purgation as recommended by Lawson Tait. Questions of technique are still much discussed and operators still report series of cases to prove that their methods are at least as good as their neighbors; but it is doubtful if modern methods for the prevention of the introduction or liberation of germs are much to be improved upon, and it would, therefore, seem wise now to devote some time to the study of therapeutics of the disease; see what we can do for the patient who, notwithstanding our best efforts, has become infected. The aim of this paper is to call the attention of the Association to a drug which has proved valuable in my hands and in those of others in treating peritoneal inflammation, but which I believe is used for that purpose by only a limited number of the profession.

The physiological action of veratrum viride has been more carefully studied by Dr. H. C. Wood than by any other observer. He describes it as a cardiac and spinal depressant. He says that it produces sweating by its effect on the circulation, and that it increases the excretion of bile by causing severe vomiting. The most constant effect of veratrum, given in medicinal doses where its use is indicated, is slowing the pulse. The pulse, although compressible, is often full, and the heart sounds are distinct and

clear. While it may be only by the vomiting that it increases the excretion of bile when used experimentally, certain it is, that bilious stools are frequently produced by doses that produce neither nausea nor vomiting when used for medicinal purposes. Clinically, veratrum will be found to be a stimulant to the liver, kidneys, skin and salivary glands. It relieves inflammatory pain and lowers temperature.

There are few diseases for which medical science has discovered specifics. In the treatment of most of them the attendant must content himself with assisting nature. He watches the course of the disease, gives such treatment as seems indicated controlling symptoms that in and of themselves are dangerous, conserving the patient's strength by securing for him sufficient rest and freedom from pain, as well as seeing that he is properly nourished, and that the emunctories are doing their duty.

Let us see how nature endeavors to cure infection in the peritoneal cavity, and what are the indications for treatment, and if veratrum meets any of them. Nature always attempts to treat peritoneal infection by keeping it within a limited area. This it can do if given time. If an appendix does not rupture until after it has been inflamed a number of days, an appendicular abscess is formed. Nature has welded together bowel, omentum and parietes with lymph manufactured for the purpose, making a wall beyond which the infection will not pass. When a Fallopian tube becomes infected, nature at once tries to bottle up the enemy by sealing the end of the tube; if unsuccessful in arresting the infection at this point, another effort is made at a more distant one. The desire to limit the infected area as much as possible seems never to be lost sight of. By thus limiting the affected area, sudden overpowering of the system by the absorption of poison from a more extensive area is prevented, and a large part of the peritoneum is left to perform the function of that membrane. The indications for treatment would seem to be, to aid nature in localizing the infection, to sustain the vitality of the patient, to stimulate excretion, and to render the patient as comfortable as possible. In order that a broken bone may unite promptly, we immobilize it with splints; that an incised wound may unite, we hold the surfaces accurately together with sutures; that coils of intestines may be sealed together with lymph, peristalsis must be stopped, and the surfaces to be united allowed to remain quietly in contact. This was the rationale of the opium treatment of peritonitis as advised by Alonzo Clark. While the action of opium on the bowels is

all that can be desired, there are serious drawbacks to its use. It arrests excretion by the kidneys, the skin, and the liver. Ochsner has taught the profession to arrest peristalsis by withholding the stimulus to it, *i.e.*, keeping stomach and bowels empty. The bowels having been immobillized in this way, veratrum meets every other indication for treatment. It sustains the heart by making its work easier; it stimulates elimination of poison by the liver, kidneys and skin; it lowers the temperature and relieves pain.

It is possible that veratrum also by its action on the circulation brings an increased army of leucocytes to the field of battle and in this way helps to destroy the invading army of germs.

In the treatment of appendicitis veratrum is not recommended to take the place of the knife. Almost every member of this Association believes that it is best to operate on every case of appendicitis during the first twenty-four hours, and with this sentiment the author is in hearty accord, but sometimes consent of the patient or family cannot be obtained, and too often the golden opportunity for an early operation has passed before the surgeon sees the case. These are the cases in which the Ochsner treatment is of great value, and to this treatment veratrum is a useful adjunct.

There is every reason for believing that the early removal of an infected tube would be as effectual in arresting the spread of the infection as is the early removal of the appendix when it is infected, but the tube is not a useless organ, and the conscientious surgeon dare not remove it until disease has so damaged it, that there is no hope of it ever being able to resume its function. In acute salpingitis, therefore, we can not resort to radical measures, but must employ such means as we possess to render the attack mild. Hot or cold applications, and other measures for influencing the circulation in the inflamed area, are much used and are valuable, but the circulation can be much more profoundly affected by veratrum, and thus it is more valuable.

Here, again, veratrum is not recommended to take the place of surgery. When an abscess has formed it should be drained. When an abdominal section is indicated, it should be made; but the judicious use of veratrum at the proper time will lessen the number of cases in which these surgical procedures are required.

In the treatment of postoperative peritonitis, free purgation is of the utmost importance. Nothing can take its place. But there are cases in which after the bowels have been thoroughly evacuated, and the stomach has become settled, the action of the heart

continues so exceedingly rapid that, if left alone, it will surely wear itself out before convalescence can be established. The most valuable agent that we have for slowing the heart in these cases is veratrum. It is infinitely better than strychnine or digitalis, because while they may urge the tired organ to work with renewed vigor, veratrum lessens its labor and gives it time to rest between beats. By stimulating the kidneys and other glands, it hastens the elimination of the poisons which are probably the cause of the rapid action of the heart.

In 1871 Fearn recommended veratrum in eclampsia and reported a number of cases successfully treated with it. Since that time it has been used by a large number of American practitioners, but I do not know of a single text-book that forcibly advises its use. Williams in his recent work only mentions it in the following words: "Nor have I ever used veratrum, so highly recommended by many American writers." Although it has been used for thirty years by a considerable number of practitioners, no fatalities have been reported from its use in this condition, and there are few who have used it boldly enough to secure the desired effect but will testify that as an agent for controlling the convulsions it is superior to chloroform or morphine or chloral, or any other drug commonly used for the purpose, and is also a powerful stimulant to the kidneys.

Although the exact cause of eclampsia is yet to be found, all will admit that faulty elimination on the part of the kidneys exists in most cases. This being true, a stimulant to the kidneys that is not an irritant is certainly indicated in the treatment. One can safely say that had this powerful remedy been first suggested by a Continental writer, instead of an American one, its use would have ere this been sanctioned by every text-book and tried by every practitioner who reads.

Veratrum is probably more used in Cincinnati than in any other of the larger cities. This is largely due to the influence and teaching of Dr. Thad. A. Reamy, who was for twenty years Professor of Obstetrics in the Medical College of Ohio. Dr. Reamy used and recommended the drug with characteristic energy. He presented a paper on this subject to the American Gynecological Society in 1895 which is the best contribution on this use of the drug with which I am familiar, but which seems to have been largely overlooked by recent writers.

The preparation of veratrum which the writer has always used is Norwood's tincture. Where prompt effect is wanted, as in

eclampsia, it is best given by deep subcutantous injections. This is also the proper way to give it when the stomach is irritable, or in treating appendicitis, when one wants to keep the stomach empty. It produces some irritation at the point of injection, but I have never seen an abscess. The dose varies from five to thirty minims, according to the size and age of the patient. It is safer to begin with a moderate dose of ten or fifteen minims and repeat it often enough to obtain the physiological effect. The toxicity of the drug is greatly overrated by the rank and file of the profession. Dr. Wm. Gillespie, a prominent obstetrician of Cincinnati, gave his own child, 9 months old, 9 minims of Norwood's tincture by mouth, when threatened with convulsions, with only the most gratifying results. Dr. H. C. Wood says: "I believe veratrum to be the safest of all cardiac depressants." Veratrum is not more appreciated, because it is often prescribed in doses that are too small to be effective.

When it is being given hypodermically, after the proper quantity for twenty-four hours has been ascertained, it should be given in three doses eight hours apart to avoid the discomfort of frequent injections. To obtain the proper results, the pulse should be kept down to between ninety and one hundred when using it for peritonitis; lower for eclampsia.

A patient under the influence of veratrum should not be allowed to rise up, but the nature of the maladies for which I have advised its use makes this caution almost superfluous. If a slight overdose is given, the foot of the bed should be elevated. It is said, that morphine hypodermically acts as a prompt and efficient physiological antidote. Whiskey is also recommended for the same purpose. I have never had occasion to use either.

For being led to use this drug in conditions other than eclampsia, the author is largely indebted to Dr. A. B. Isham, to whose paper published in the New York *Medical News* he would refer those interested in the subject.

OPERATIONS IN IMPERATIVE SURGERY IN PRIVATE HOUSES; A DEMONSTRATION OF SURGICAL TECHNIQUE.

By WILLIS G. MACDONALD, M.D.,
ALBANY.

THE advantages of the well-equipped hospital for surgical work are so well understood by both physicians and the laity, that argument is no longer required. Yet occasions frequently present where operations must be performed in private dwellings, and under the most adverse circumstances in imperative surgery. Such conditions obtain in localities remote from hospitals, where removal, through lack of transportation facilities, or loss of time is impracticable. In order that surgical relief may be afforded in the emergencies of surgery occurring in mountain camp or remote summer resorts, in villages away from railroads, and where the condition of the patient will not permit removal, the surgeon must devise an operating technique which under adverse surroundings will allow him to complete aseptically the required operations and prevent sepsis as a factor in surgery. In abdominal surgery the following conditions in their order most frequently require operations in private houses: acute appendicitis, intestinal obstruction, strangulated hernia, peritonitis from perforation of the gastro-intestinal tract, gastric duodenal and typhoid ulcers, extrauterine pregnancy and conditions requiring the Cesarean section, acute cholecystitis, gunshot wounds, and other acute abdominal disease of obscure or traumatic origin, but presenting symptoms immediately dangerous to life and demanding immediate exploratory incision.

To substitute practically the conditions of the hospital in the treatment of such cases as lie without the circle of the ambulance is the problem presented for our consideration.

Experience teaches very early that but little assistance is to be obtained as a rule in the home. The mental anxiety attending the critical illness of a member of the household unfits both friends and attending physician for the preliminary preparation for the operation, which naturally might be expected.

In a considerable experience it is the exception that a room

has been prepared for operation, or sterile water provided. Sterilized utensils, towels, sheets and dressings are practically unknown unless a trained nurse has been on duty for a day previously.

To meet the exigencies of itinerant surgery nearly every surgeon has planned a more or less complete traveling operating kit, always in readiness for immediate use, varying in magnitude from a single handbag to one or two large trunks. One is as deficient

FIG. 1 represents a large room with painted walls and polished floor from which furniture and rugs have been removed save a chiffonier and two footstools. Household utensils are assembled in the room as provided by the list of articles required from the household, without reference to arrangement.

Note the leather cases on the kitchen table in the foreground representing the surgeon's kit, also the large agate vessels containing wash bowls and pitchers and rubber goods already under sublimate solution 1-1000.

as the other is immobile; the disadvantages are equal and both fatal to success or peace of mind. Whether it is worse to be handicapped by insufficient and unsuitable instruments and dressings or to wait six hours for the next train to bring your baggage delayed by stupid expressmen, I am unable to decide. A little perseverance, however, will develop an operating kit readily mobile, of not excessive weight, and amply sufficient for any emergency. The one shown you is the product of a practical

evolution in compactness gained through several years of active surgical experience. It is true that several utilities, such as traveling operating tables, basins and instrument stands have been discarded and that towels, sheets, suits, dressings, sponges and ligatures are all carried sterile instead of being sterilized in the home prior to operation. This method has advantages too manifest to require further demonstration.

To return to a more particular description the outfit will be observed to consist of two packages—an oblong leather bag of commercial size (17 x 12 x 10) and a leather cylinder. The contents of the larger leather bag comprises the following articles, classified as:

General:

Two operating suits, including caps and aprons (wrapped and sterilized in autoclave).

One Kelly pad, two pure gum sheets (one yard by three-fourths).

One large pure gum irrigator.

Three pairs operating gloves.

One stomach and rectal tube.

One tube sterile vaseline.

One combination instrument sterilizer with instrument trays.

One quart sterile water in flask, sealed.

One saline infusion apparatus.

One package sterile salt capsules.

Skin Sterilization:

One razor.

Two sterile brushes (wrapped and sterile).

Two large gauze towels (wrapped and sterile).

One package green soap, U. S. P.

One package sublimate tablets (gr. 3½).

One flask alcohol (95 per cent.).

One flask tr. iodine.

Anesthesia:

One ether inhaler, "Kocher."

Stronger ether 500 grm.

Ethyl bromide 50 grm.

Cocaine-adrenalin-chloretone sol. 50 c.c.

One hypodermic syringe with assorted tablets, morphia, strychnia, nitroglycerine and atropia.

One large cocaine infiltration syringe (Leur).

Instruments:

Scalpels, small assorted case, with hernia knife.

Three scissors, *sharp, straight* and *curved, blunt.*

Retractors, one pair medium angular.

Artery forceps, ordinary, one dozen; heavy, six assorted.
Forceps, long dressing, two; bullet two.
Intestinal clamps, ordinary, two; O'Hara's, one.
Murphy buttons, one full set.
One needle-holder; assorted needles.

Extras:
Threaded sterile intestinal sutures, in waxed papers.
Extra and special needles. Extra silk, catgut, silver wire.
Assorted drainage, glass (special) and rubber.
Irrigator nozzles.
Catheters, glass and rubber.
Rubber dam.

Dressing:
One package iodoform packing.
One package iodoform tamponade.
One sterile paraffine bandage (six inch).

The contents of the leather cylinder is an autoclave nickel container which is charged, sterilized and placed in leather cover for transport without contact and is only opened at the immediate beginning of the operation.

It contains:
One large gauze sheet to cover patient.
One package sterile towels (eight).
Three packages sterile tampons (six).
Two packages sterile gauze sponges.
One complete abdominal dressing with bandage and pins.
One tube each of silver foil, sterile silk and silkworm gut, sufficient for any ordinary operation.

The presence of the well-trained assistant, familiar with the operator's method is indispensable to satisfactory work, and a proper reference to his duties finds its place here. By the time the home of the patient is reached the assistant will have gained a sufficient knowledge of the case to estimate the probabilities of operation. He can during the time of consultation and examination be of much assistance in making a reconnaissance of the house with a view to the selection of a suitable operating room and the sources of the improvised operating room furniture necessary. The operator informs his assistant at the earliest moment of the decision for operation. I usually do it by sending a request for the iodine which means operation to him. Parenthetically, I should like to speak of the use of the tincture of iodine in skin

disinfection in emergency surgery. I have been impressed with its utility as a rapid chemical antiseptic when applied to the skin, the value of which was impressed upon me by Prof. Kocher, some years since. It has become a practice with me to paint the field of operation freely a few moments prior to the preliminary table preparation of patients. I have not seen a stitch abscess since the employment of iodine in this manner.

This paper would not be complete without a brief description of the selection and arrangement of a room for the operation. If

FIG. 2 represents the final preparatory arrangement of the room, employing only the articles displayed in the preceding photograph. Note the use of the sheets as tarpaulins for all furniture. The chiffonier, covered, affords on its top a place for general supplies. The small table in the foreground shows instrument sterilizer and instruments. Operating-table fully prepared with Kelly pad and drains.

the operation is to be performed immediately, avoid all violent moving of furniture, or removal of rugs and hangings. Such bacteria as are present are peacefully resting with the dust on the furniture. An energetic housemaid with a dusting cloth can so bacteriologically vitiate the air that the danger of air infection becomes real for the following two hours. A part of the dust evil may be avoided in the selection of a room without carpets and as free as possible from decoration, hangings. Move furniture as little as possible and employ the methods of the fire protectives

in covering with clean sheets. Cover carpets under operating table with sublimated sheets tacked down. It may be stated generally, that the entire removal of carpets, furniture and hangings should only be undertaken, when an interval of at least four hours remains before the operation is to be undertaken.

In the meantime, your assistant has prepared the operating room and has assembled the necessary household furniture, and has given to all responsible members of the household the following printed slip:

Furnish at once all of the following articles, or as many of them as possible:

A kitchen table, or dining-room table, closed.

Three bedroom tables or wash stands without backs. Substitutes, center tables, sewing tables, or an ironing board, or a broad leaf from the extension table.

Three kitchen, or dining-room chairs of wood.

Flannel blankets (single 2). One comfortable.

Towels (12). Sheets (6 to 12).

Small basins or china bowls from the kitchen (1 to 4).

Two clean wooden pails, one filled with strained cold water, for sublimate solution 1-1000.

Substitutes for pails, clean wash tub (small). Large agate mixing bowls or infant bath tubs.

Sets, wash stand (1 to 4), only bowls and pitchers required; freshly washed.

Safety pins (1 to 2 dozen). One package carpet tacks.

(Separate here and give to a single individual to prepare.)

Water for operation, give it your first attention.

Hot, boiling thirty minutes and delivered in original vessels to operating room; quantity, three gallons.

Cold sterile, in original vessels or in sublimated vessels packed in ice; quantity, one to three gallons; prepared by boiling thirty minutes and cooling under cover.

Cold strained, strain through several layers of clean muslin; quantity, six gallons.

The surgeon having given the general directions for the patient as to clothing, evacuation of the bladder, and preliminary hypodermic stimulation, if required, makes a general inspection of operating room, gives such further orders as are necessary to complete the detail and changes his clothing. During the preliminary anesthesia the surgeon selects and sterilizes the necessary instruments, arranges them, and gives his hands a preliminary scrubbing.

The patient in primary anesthesia is brought to the table, placed on sublimated Kelly pad, extremities wrapped in flannel

blankets, and the field of operation isolated by sublimated rubber sheets. At this point the assistant is excused to prepare his hands for operation. During the continuance of the anesthesia the field of operation is further prepared by soap massage, shaving, scrubbing with hot water and soap five minutes; followed by washing with sublimate solution 1-1,000 five minutes and, alcohol sponging two minutes. While the surgeon completes the toilet of his hands, the assistant, already prepared, arranges the sterilized gauze sheets and sterilized towels for the operation.

FIG. 3 represents the table preparation of the patient by the surgeon. The nurse's duties are purely subsidiary, and can be performed by any intelligent person. Note the arrangement of Kelly pad and rubber sheets for the protection of the patient. The table in the foreground shows instruments in covered trays already sterilized.

The preliminary incision required by the operation is made, the necessary sponging being done with dry sterile sponges. With the completion of the preliminary abdominal incision the problem of protective tamponade presents itself, in order that infection may be avoided through imperfectly sterilized water, dry sterilized paraffine gauze has been substituted for hot normal salt solution saturated tampons. The paraffine gauze tampon is nonirritating to the peritoneum and protects surrounding tissues far better than plain gauze by preventing transudation of infectious material. I am familiar with the intraabdominal use of tampons wrung from

hot sublimate solutions advocated in septic cases by Deaver, Fowler and others. Having once abandoned the use with good reason, I think, of chemical antiseptics within the abdomen, I can not readily return to the practice. Temporary abdominal tamponade to be effective must be complete and painstaking besides; it must be undertaken before the infected area has been disturbed by unnecessary manipulations. Tamponade after pus is running is like locking the barn after the horse is stolen.

Doubtless the thought has occurred to many of you watching

FIG. 4 represents the final arrangements in detail and primary incision. The first assistant has a table containing sponges, tampons, and affords a supply of hot normal salt solution. At the side of the operator are the instruments, ligature and suture material. Details of operation not shown.

the demonstration that the method furnished abundant opportunity for the loss of gauze sponges and tampons; practically the accident has not occurred. The rule never to allow a gauze sponge to leave the hand except to be grasped by an instrument or thrown away is inflexible. The tampons are counted three times by different persons before wrapping and sterilization, are counted as used, and separately reassembled under the eye of the surgeon before the abdomen is closed.

The closure of the abdominal wound after imperative abdominal operations is frequently incomplete in cases requiring drainage or

permanent tamponade. Under such circumstances silkworm gut and the through and through method is, in my experience, the most satisfactory. In cases where infection can be excluded, the method of layer suture with Cumol catgut is to be preferred, except in incision involving the epigastric region, where the fascia should always be united by nonabsorbable sutures or aluminum bronze silver wire, silk or silkworm gut. Every effort should be made to avoid drainage in emergency surgery. It always, even

FIG. 5 illustrates an operation for acute appendicitis completed and the dressings applied. Lack of definition in the photograph does not fully illustrate the abdominal binder or its application, but shows generally the conditions prevailing at end of operation.

under the best conditions, affords opportunities for post-operative infection.

The abdominal dressing employed, consisting of plain gauze, gauze and cotton pads, is held in place by a many-tailed bandage, the application of which is sufficiently well known. The operation is completed.

The description already given demonstrates very fully the usual routine. Numerous departures are required on occasion. Vomiting, a very common symptom, in the conditions under consideration, is frequently a source of great danger during opera-

tion. Patients literally are drowned in their own vomit. A gastric lavage immediately before the anesthesia greatly benefits the patient, but cannot always be employed, especially in patients already greatly exhausted; in such cases local anesthesia is of peculiar value. Local anesthesia by means of cocain-adrenalin solution may be employed when general anesthesia is contraindicated. A cholecystotomy or enterotomy can be readily performed without pain by means of local anesthesia. Such anesthesia is the method of choice in strangulated hernia. Once within the ab-

FIG. 6 illustrates the improvised operating room ten minutes after the completion of the operation. Instruments are being cleaned and articles reassembled for packing and laundry.

domen, operative measures are not especially painful unless irritation produces peristalsis, or the mesentery is unduly pulled upon.

After-Treatment.—The operation completed, and the patient safely in bed, measures are taken for the relief of shock, if required, otherwise quiet is enjoined and a competent watch or nurse placed at the bedside with strict instructions not to leave the patient alone under any circumstances until consciousness is fully recovered. Neglect of this precaution is responsible for many cases of aspiration pneumonia and other avoidable complications. Owing to many misunderstandings in the subsequent management of cases, the following printed outline of treatment is left with the attending physician:

Suggestions for the After-Treatment in cases of Abdominal Surgery, Based upon some Considerable Clinical Experience.—(Not compulsory but advised as useful as a general guide.)

Shock.—Severe, associated with severe hemorrhage during the operation or distinctly lowered arterial tension from other causes. Saline infusion, 1,000 c.c., to be repeated in four hours if patient is not greatly improved. Enemata, stimulating, of black coffee ʒii, of whiskey ʒi and hot normal salt solution ʒvi, every four hours. Adrenaline chloride gr. $^1/_{30}$, every hour or strychniæ sulph.

FIG. 7 illustrates improvised operating-room a half-hour after operation; the surgeon's kit is reassembled and illustrated in the foreground ready for transport. Blood and pathology, the offensive features to the lay mind, have been removed to the laundry or are in the surgeon's kit awaiting laboratory investigation.

gr. $^1/_{20}$ every four hours; external warmth. Moderate, saline and whiskey enemata ʒvi every four hours alternating with strychnia sulph. gr. $^1/_{30}$. Slight, saline enemata ʒviii every four hours (given chiefly for thirst).

Pain.—Give morphia sulph. gr. ¼ to ⅓, before patient becomes very restless after operation. After immediate effects of operation have passed, avoid anodynes, if possible. Later pain means bowel distension or septic peritonitis, appropriate treatment given later.

Vomiting.—Vomiting during the first twenty-four hours, with-

hold everything by mouth, mustard to epigastrium, followed by icebag. Vomiting continued to second day, lavage of stomach or cocain gr. ⅛ in a teaspoonful of hot water every hour. Withhold all food and water and give, if improvement is not immediate,

Cocain hydrochlorat .....gr. i
Codeiæ sulphat .....gr. i
Hydrard. chlor. mite .....gr. xii
Bismuth subnitrate .....gr. xxx

Ft. mass et div, in capsul, nr. viii.

Sig.—One every hour with little hot water. Follow the last capsule with milk of magnesia, half ounce every hour until bowels move freely.

Vomiting Absent.—Withhold all food for twenty-four hours. Give hot water very sparingly (no ice or lemonade).

Diet, First Day.—Fasting for twenty-four hours with small quantities of hot water. Adults may be allowed to wash mouth with cool water without swallowing repeatedly. Give saline enemas for excessive thirst.

Second Day.—Give clam or beef bouillon, liquid peptonoids, expressed beef juice or egg albumen.

Third Day.—Add matzoon, milk with lime water or peptonized, clear soups, cold or carbonated water.

Fourth Day.—The bowels having moved satisfactorily, add custard, cream, thick soups, boiled rice.

Fifth Day.—Light diet, unless Murphy button has been used, or a gastroenterotomy done, when liquid diet must be continued for a week. A return of nausea and vomiting should be treated by prompt withdrawal of food and attention to the condition of the bowels.

Distension.—Distension not associated with nausea and vomiting, give,

Acid carbolic .....m xxiv
Menthol .....gr. ii
Magnesii hydrat. fluid .....zii

Sig.—A teaspoonful in a little water every two hours; or, give a high ox-gall, or Epsom salts and glycerine enema.

Distension with vomiting, lavage of the stomach, and the enemata already ordered.

The Bowels.—Give calomel in divided doses at beginning of third day (see nausea capsules), or earlier if indicated by vomiting or distension. Follow by saline, and if uneffectual by high enema, magnesia sulphat, ℥iv; glycerine, ℥iv; warm water. In-

struct patient to retain it as long as possible. Repeat treatment, as required, during first week, after which usual laxative may be used.

Urine.—Allow patient to void, if possible. Catheterize at 6-8 hour intervals, if required. Use every precaution in both sexes. Cystitis is a frequent and annoying complication during convalescence.

Drainage.—Glass, changing packing every hour, until secretion becomes less and serous. Great care to preserve asepsis must be exercised in changing the dressing. For the care of drainage employing rubber gloves and every precaution.

Substitute rubber for glass in —— hours, providing drainage lessens and becomes clear.

Remove gauze drains in —— hours; substitute rubber and irrigate daily.

Replace gauze drains by simple gauze tamponade in —— hours.

Dressings.—In absence of wound drainage, leave primary dressing undisturbed for ten days, unless high temperature, after second day points to wound infection.

Posture.—After the first twenty-four hours, allow patient to assume, with assistance, any comfortable posture. It is safe.

Place elderly patients in a sitting posture as early as the fourth day if possible; danger, senile pneumonia.

General Observations.—Prohibit visitors save brief visits by near relatives twice daily for first week. Keep chest protected from all exposure, especially in the aged. Pneumonia is frequent and fatal complication in emergency abdominal surgery. Moderate fever of the second day may be expected after severe operations and is without danger. Remember that the operator has a lively interest in the subsequent progress of the patient and is ever ready to lend assistance by telephone, telegraph, or in person when all is not going well.

Further Suggestions.—The following circular is given to the nurse when an opportunity for preliminary preparation is afforded.

DIRECTIONS FOR NURSE, ON DUTY TWELVE TO TWENTY-FOUR HOURS PRIOR TO OPERATION.

Supplies to be taken with nurse:

One slip, directions for nurse.

One slip, articles wanted household.

One razor.

One nail brush; green soap (℥iv); sublimate tablets (100); alcohol, one pint; plain gauze, unsterilized, 25 yards.

On duty after preliminary instructions from attending physician if present:

Examine room selected for operation and have it stripped absolutely to bare floor and walls. Wash wood work and floor with sublimate 1-1,000. Walls, if painted, may be washed with sublimate solution otherwise brush carefully with moist sublimate cloths.

Assemble in rooms all articles on slip, articles wanted from household and have them thoroughly washed, with soap and water and sublimate 1-1,000. The wash bowls and pitchers may be placed immersed in sublimate 1-10,000. When preparations are completed air the room, then close all windows and lock the door.

Secure a clean wash boiler and fill with strained water and boil at night for thirty minutes; reboil in morning for same time and set aside five gallons in clean sublimated covered vessels to cool. This water may be immediately placed in operating room. Refill boiler and have heated an hour before time for operation. This will provide hot water for operation.

Give patient a general bath in tub or bed, as directed by attending physician, after enema and douche and dress in clean night clothing. Boil in suitable vessel or steam cooker, five one-yard pieces of gauze, and one five-yard piece of gauze folded as compress to cover entire abdomen. Massage abdomen gently with green soap, giving particular attention to the umbilicus and the folds of the groin for five minutes.

Shampoo with hot water and gauze sponges, for five minutes. Shave, including the region of the nymphæ in the female. Continue washing with water until all evidences of soap disappear. With fresh gauze sponge wash with sublimate 1-2,000, using friction for five minutes. Wash with alcohol and saturated large abdominal compress in sublimate 1-1,000 and secure in place by a many-tailed binder of muslin.

Give laxative under direction of attending physician. Calomel preferred. Give water freely during night, unless vomiting is present.

In early morning give a saline cathartic followed by a cup of hot coffee or strong tea. Two hours before operation, if bowels have not moved satisfactorily, give enema. Sterilize hands and remove abdominal dressing, saving large compress to reapply. If skin is not irritated, sponge again with alcohol and sublimate and reapply compress this time 1-2,000; readjust binder and dress

for operation in clean short flannel undervest, flannel drawers and stockings and muslin night dress. All general preparations should be completed an hour before the time of operation, in order that the patient may have the opportunity for quiet and rest. Just prior to anesthesia the bladder should be emptied voluntarily or by catheter.

The hour prior to operation should afford the nurse a brief moment for rest, and the opportunity of inspecting her general preparations. The hot water may be brought up in original vessel by servants in the house during primary anesthesia.

The surgical assistant will complete the arrangement of the operating room. During the operation the nurse will be in readiness to lend such assistance as may be required.

Have the bed freshly prepared for the patient with basins and towels at hand if vomiting occurs.

Follow the directions for after-treatment given by the attending physician.

With the usual remarks embraced in "in conclusion," I may be allowed to say that the system presented to you represents no newer fad of mine. The kit shown you bears the evidences of the stains of travel and is frequently formaldehyded. The cylinder has been my travelling companion for nearly ten years; the larger bag succumbs to the ravages of time and travel and the one shown you represents at least the third of a series, its immediate predecessor having withstood the demands of the Spanish-American War, although it saw little field transportation; yet with a little substitution it might well afford superior advantages in military practice where compactness and ease of transportation are first essentials. It appears to me, that a sealed and sterile container representing in a general way the contents of the container shown you to-day, prepared and sealed at a central government station and issued with medical supplies to armies in the field, presents with the employment of the dry method in surgery the highest probabilities of asepsis in military practice. The field hospital presents practically few opportunities for the organization of asepsis. It presents many opportunities with aseptic materials at hand for doing complete work. The conditions of the civil surgeon in emergency practice are so identical with those of the military surgeon in many features that the comparison of their difficulties is inevitable. The sealed package of sterile surgical dressing and essentials for operation in military surgery has not commanded the attention of military medical

authorities that it should. The military surgeon, confronted by the necessities of an immediate abdominal section, would feel far more at ease in the presence of a sterile cylinder made of thin tin and hermetically sealed, containing essentials for an operation than in the total equipment of the mobile camp. Success in the military surgery of the abdomen predicates special preparedness, in the way of operative facility, and the employment of dry methods of operating. The military surgeon of to-day should be able within an hour to place in motion all the facilities of the itinerant surgeon and with almost equal success. A single pack mule, properly loaded with a general operating kit upon one side, and dressing in sterile containers on the other side of the saddle, would afford abundant supplies for at least twenty-five laparotomies.

A CONSIDERATION OF COMBINED ECTOPIC AND INTRAUTERINE PREGNANCY, WITH REPORT OF CASE.

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EXTRAUTERINE pregnancy occurs so frequently that the report of a single case must have some valid *raison d'être.* It seems of sufficient interest that a patient should contract gonorrhea; that she should conceive coincidentally in the uterus and tube; that she should have rupture of the tube with a classical picture of that accident; that the products of misplaced conception should be removed by abdominal section, and that she should have a smooth convalescence, go to term, and give birth to a healthy child. Such, briefly, is the case I have to relate.

Many interesting questions, some of them intensely practical, are represented by those victims of ectopic gestation who are also normally pregnant. They relate chiefly to the types and frequency of this condition, to its diagnosis, to the errors that have been made, and to their bearing upon rational lines of treatment. For convenience, the term "compound pregnancy" will be used to express the combination of ectopic with intrauterine gestation.

The etiology of this condition is that of simple ectopic gestation and need not be referred to here. A study of the recorded cases appearing in literature, however, reveals such essential differences in their course as to require a grouping of the individual cases into various classes, to-wit:

Compound pregnancy, Class I. The woman becomes pregnant while carrying the dead products of an ectopic gestation.

Compound pregnancy, Class II. The ectopic and intrauterine products of conception are both living at the same time. The cases are naturally divided into three groups, according as

(a) Ectopic conception precedes the uterine.

(b) Ectopic conception follows the uterine.

(c) Ectopic and uterine conception occur coincidentally.

Class I. includes the available cases in which the ectopic fetus was clearly dead before uterine conception occurred. From the large number of cases in which the products of misplaced pregnancy have been retained for years at varying degrees of development and preservation it seems highly probable that many such cases are not included in the list here given. This might easily happen if the title of the article failed to indicate that a compound pregnancy existed. I have been able to collect only sixteen such cases, though Parry (88) found twenty-two in a series of 499 ectopics studied.

Class II. (a) includes all the cases available to the writer in which the sequence of events clearly shows that the ectopic preg-

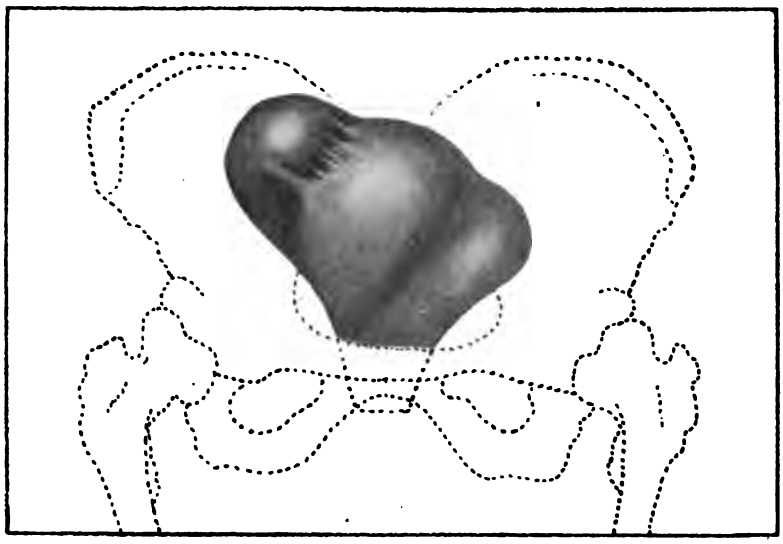

Fig. I.—Illustrates irregular contractions of uterus in case of combined normal and ectopic pregnancy. Ectopic removed, uterine went to term.

nancy began at least a month before the uterine pregnancy, and continued to develop for some time after the existence of its twin embryo began. Convincing evidence of such a condition has been found only three times.

Class II. (b) should include the cases in which it seems probable that uterine pregnancy was in existence before the extra-uterine ovum was fecundated. This class must necessarily remain small, and positive proof of its right to exist is, I think, lacking. It is not sufficient that an ectopic fetus should be smaller than its

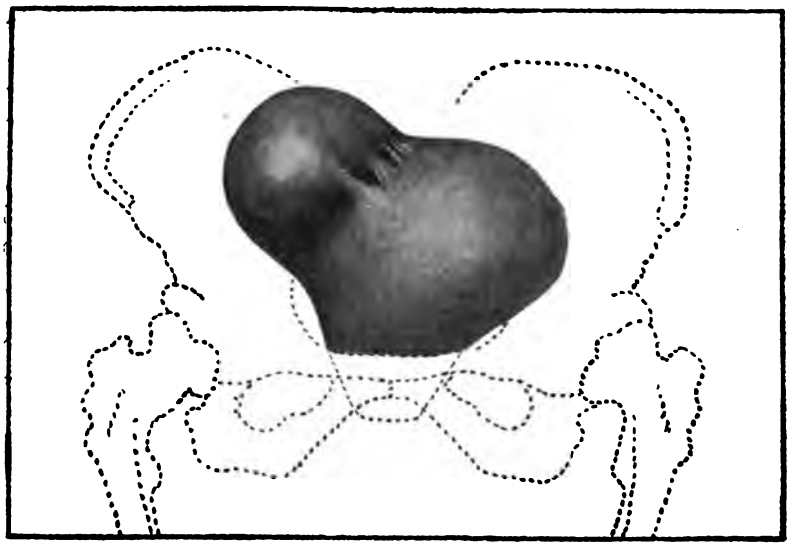

Fig. II.—Relations of ectopic and uterine pregnancy as found at operation. Ectopic removed, uterine went to term.

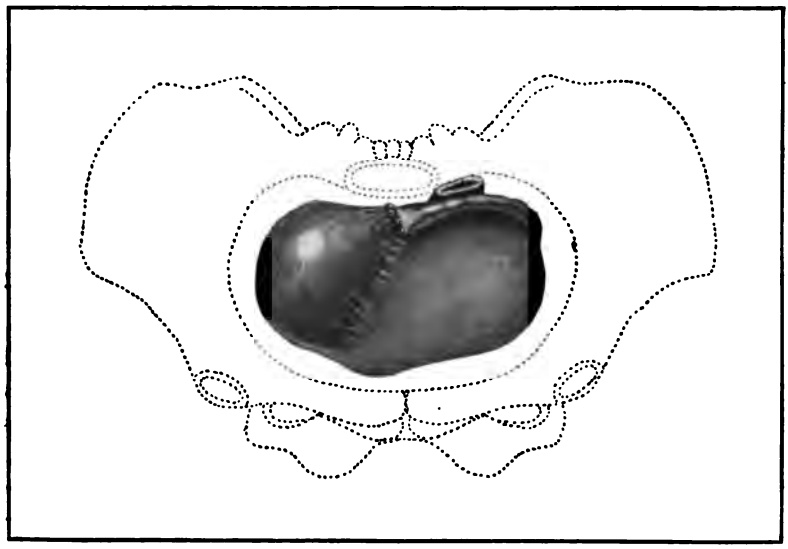

Fig. III.—Relations of ectopic and uterine pregnancy as found at operation, showing adhesions. Ectopic removed, uterine went to term.

uterine twin, for it so often happens that such a fetus is dwarfed by limited nourishment. (Cragin and Galabin.) Christer-Nillsson studied them critically, and I think properly concludes that the two pregnancies began at the same time. I have found no others to take their place.

Class II. (c) includes those cases in which the clinical course indicates fecundation of the two ova at or very near the same time. I have found ninety-eight recorded cases of this kind.

Frequency.—The history of ectopic gestation shows that for very many years the reported cases were largely those that forced their own recognition by going to term, by a violent explosion or by expulsion of the fetus from a suppurating sac. With evolution of modern methods of finding, interpreting and treating gross pathological lesions, however, a transformation has been wrought here, as elsewhere. It should fast become the rule to recognize compound as well as simple cases of hemorrhage into the ovum, tubal abortion, early, slow and rapid rupture and unruptured ectopic pregnancy. In the past these cases were rarely reported, perhaps rarely recognized. But with growing skill we have an increasing literature of the general subject and of compound pregnancy as well. Thus a chronological study of accessible reports shows fifty-six authentic cases of compound pregnancy in all the decades prior to 1893, and fifty-six reports in the ten succeeding years. That this increase is due to more frequent recognition, rather than to a more complete record of recognized cases, is made clear by the fact that the proportion of conspicuous cases remains unchanged, while the less conspicuous ones have greatly increased.

Oversight thus seems to have been the most common cause of error. The error itself has usually consisted in recognizing the uterine pregnancy and mistaking the ectopic for inflammation consequent upon emptying the uterus, for a neoplasm (commonly an ovarian cyst), or in recognizing the ectopic and simply overlooking the uterine pregnancy until it has made itself known.

Another very common error has been to recognize the ectopic pregnancy and to consider the uterus with its growing decidua as a normally pregnant uterus, or to mistake a discharged decidua for a cast-off ovum.

Because of the actual frequency and perilous course of this condition, it is therefore important that every case detected should receive wide professional publicity. Especially is it incumbent upon the authors of text-books on obstetrics and teachers of that

No.	Reported by	Year Occurred	Year Pub.	Age of Mother	Para	Duration of Pregnancy		Result to—			Diagnosis of Compound Pregnancy was Made
						Intra-uterine	Extra-uterine	Mother	Intra-uterine Fetus	Extra-uterine Fetus	
1	DeBelamizaran, Z.	1836	1838	35	VI	9 mos.	?	Rec'd	Lived	Died Retained	At 6th month of uterine pregnancy
2	Bossi	1865 1866	1867	25	IV	29 wks.	9 mos.	Rec'd	Lived	Died Retained	At 5th month of uterine pregnancy
3	Haderup	1867	?	24	I	9 mos.	4 mos.	Rec'd	Lived	Died Discharged	Before delivery of intra-uterine fetus
4	Day, E. E.	1863	1865	?	V	?	3-4 mos.	Died	Still born	Not viable	At autopsy
5	Ribot,	1873	1876	37	III	9 mos.	?	Rec'd	Lived	Died Retained	During course of normal pregnancy
6	Lamy	1872 1873	1876	?	Multipara	9 mos.	9 mos.	Lived	Lived	Died; retained; later discharged	During course of normal pregnancy
7	Köhne, W. H.	1886	1887	?	Nulli	9 mos.	?				
8	White, J. H.	1886	1887	37	I	7 mos. induc'd d'liv'ry	8 mos.	Died	Died	Died Retained	At autopsy
9	Gutzwiller, D. H.	1891	?	35	III	3 mos.	8 mos.	Lived	Abort'd 3 mos.	Died	After abortion of intra-uterine fetus
10	Mathewson, H. P.	1894	1898	30	Multipara	Two 9 mos.	9 mos.	Lived	Both lived	Stabbed; retain'd; shrunken	After delivery coincident uterine fetus
11	Bovee, J. W.	1889	1898	30	II	9 mos.	9 mos.	Lived	Lived	Died Partly expelled; removed	Ectopic made at full labor. Uterine containing normal gestation 6 years later
12	McClintock, J. C.	1894	1895	30	I	3 mos.	7 mos.	Lived	Aborted, criminal	Died Removed later	After uterine abortion
13	Lotheissen, Geo.	?	1895	?	?	?	2 mos.	?	Abort'd twice	Died Removed	Made at operation after 2 abortions
14	Mann, M. D.	1884	1895	33	Nulli	Three 9 mos.	9 mos.	Lived	Three lived	Died Retained 13 years; removed	During first uterine pregnancy
15	Mondy, S. L. C.	1902	1903	27	IX	6 wks.	? wks.	Lived	Abort'd	Died	From specimen after abdominal section
16	Geyl	1898	1903	35	I	3 wks.	4½ mos.	Died	Not viable, abort'd	Not viable; removed	At abortion

Nature of Error in Diagnosis	Site of Extra-uterine Ovum	Classification and Evidence		Bibliography	Remarks
Correct	?	I	Hist. abdom. preg. fol'd by uterine	1	
Correct	?	I	Hist. shows ectopic died 22 mos. before ut. began	2	
	Right tube and ovary	I	Ut. began 1-2 mos. after octopic died (C-N).	3	Ectopic fetus discharged through anus 2 months before delivery of intra-uterine child (Zinke).
Ectopic overlooked	Right side cul-de-sac	I		86	History would indicate both fetuses probably lived at same time, though title explicitly states uterine followed ectopic fecundation.
Correct	"Left ovarian"	I	Ectopic began 1873. Ut. began 1875	5	2 translations, one original article in Gazette Obstet. the other correspondence Jour. de Med. et de Chir.-art. 10408, first cred. to Dibot, second to Ribot. Facts so similar that it is probably same case.
Correct	Left pelvis	I	Ectopic died June 1872. Ut. began February, 1873.	6	Patient later died, diagnosis tuberculosis. Occasional discharge pus and bones from vagina.
	Cul-de-sac to right and behind uterus	I	Statement by author	7	Translation. No other data available.
Uterine recognized. Ectopic mistaken for tumor	High in abdomen	I	(Also IIc) Premature delivery and autopsy	8	This case also appears in table IIc.
Combination overlooked	Left tube	I	Abortive and operative findings	9	Ectopic fetus removed by abdominal section.
Ectopic overlooked till after delivery	Left tube	I	(Also IIc) Shape, movements, heart sounds	10	Attempt to kill ectopic by aspirating amniotic fluid. Its death made certain by thrusting trochar into fetal chest.
Correct	Left abdomen	I	Fetal movements and false labor in 1889. Delivery at term in 1895. Ectopic removed later	11	Infection of gestation sac. Expulsion of bones per rectum. Two weeks later fetus removed by abdom. section. Sac remained. Fecal fistula.
Ectopic overlooked	Right side	I	Dead 7 mos.; ectopic fetus removed immediately after 3 mos. uterine abortion	12	Abdominal section.
Ectopic overlooked. Mistaken for cyst	Middle of right tube	I	One month after uterine abortion macerated 2 mos. ectopic removed	13	Abdominal section. Considered coincident by Christer-Nilsson.
Correct	?	I	False labor 1884, after apparently normal pregnancy. Three children born later	14	Intestinal complications requiring two resections at time of removal of ectopic products by abdominal section.
Ectopic mistaken for inflam. condition	Left tubo-ovarian; "sac lying between tube and ovary"	I	(Also IIc) Abortive and operative findings plus dates	15	In 6 months 4 times pregnant in uterus and once in tube. Third uterine and tubal probably coincident. While carrying ectopic products 4th uterine pregnancy lasted 6 weeks. Pregnant twice subsequently making 10 uterine pregs. and one tubal in 2 years.
Uterine pregnancy overlooked	?	I	Old dead 4½ mos. ectopic fetus removed by abdominal section; then 3 weeks ovum expelled from uterus	87	

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						Intra-uterine	Extra-uterine	Mother	Intra-uterine Fetus	Extra-uterine Fetus	
20	Duverney	1708	?	21	0	3 mos.	3 mos.	Died			At autopsy
21	Lachapelle, M.	1811	?	?	?	6 mos.	3 mos.	Died	Died	Died	After delivery intra-uterine fetus
22	Geoffrey, Niessen	?	1722	?	?	Two 9 mos.	?	Lived	Two lived	Died Retained	At autopsy, 10 years after delivery
23	Gaessman, N.	1820	1820	23	I	9 mos.	9 mos.	Died	?	Died	After delivery intra-uterine
24	Stark, J. P.	?	1822			9 mos.	9 mos.				At confinement when first seen
25	Trezvant, D. H.	1825	1825	?	?	5-6 mos.	One, 6 weeks One, 6 mos.	Died	Died	Died	At autopsy
26	Whinnery, E. D.	1845	1846	26	III	9 mos.	9 mos	Died	?	Died	After delivery of intra-uterine pregnancy
27	Ambrasioni, Gaetano	1846	1846	28	II	9 mos.	9 mos	Lived	?	Died	At confinement
28	Gordon, F. H.	1847	1848	?	?	6 mos.	6 mos.	Died	Not viable	Not viable	Diagnosis made before abortion
29	Weber, C. A.	?	1848	28	I	9 mos	4 mos.	Lived	Lived	Died	After delivery
30	Craghead, Wm. G.	1849	1850	35	II	3 mos.	3 mos	Died	Not viable	Not viable	At autopsy
31	Packard	1849	1859	35	?	3 mos.	3 mos.	Died	Abort'd	Not viable	At autopsy
32	Rosshirt, J. E.	1849	1851	?	?	9 mos.	?	?	?	?	?
33	Buck, W. D.		1855	25	?	3 mos.	3 mos.	Died	Not viable	Not viable	At autopsy
34	Clark (e), J	1856	1856	40	II	9 mos	9 mos.	Lived	Lived	Died Retained	During labor
35	Taffnell	1860	1862	?	I	3 mos.	2 mos	Died	Not viable	Not viable	At autopsy
36	Pellischek, F. T.	1861	1865	38	Multipara	9 mos.	9 mos.	Lived	Lived	Died Retained Encysted 1 year	After delivery intra uterine
37	Cook (e), L. R	1862	1864	39	III	9 mos.	9 mos.	Died	Died	Died	Before delivery intra uterine child
38	Pennyfather, J. P.	1862	1863	38	V	9 mos.	9 mos.	Lived	Still birth	Died Retained Encysted 8½ mos.	After delivery intra uterine child
39	Mascagni, Paulo	1802	1874	37	XIX	3 mos.	9 mos	Lived	Abort'd	Died Retained	After abortion
40	Sager, A.	1870	1870	?		3 mos.	3 mos.	Died	Not viable	Not viable	At autopsy

of Error agnosis	Site of Extra-uterine Ovum	Classification and Evidence	Bibliography	Remarks
erlooked	Right tube	IIc Autopsy findings	16	Maternal death from ruptured ectopic sac and internal hemorrhage.
n overlooked	?	IIc Delivery 6 mos. fetus 3 mos. after death of 3 mos. ectopic	17	
erlooked	Right tube	IIc Statement of author	18	By reason of conflicting statements accuracy of conclusions questioned.
rlooked	Left tube and ovary	IIc		
	?	IIc Statement both fetuses living at confinement	19	Translation from Italian. Further data lacking.
l	One not given; other in small ovum attached to outer surface large sac	IIc Intra ext. uterine fetuses of same age living; death of mother	20	Death due to rupture ectopic sac and internal hemorrhage.
?	?	IIc	17	Ectopic attained 2 years. Pieces discharged through ulcerated abdominal wall.
at confinement.	?	IIc Fetal movements felt from 5th till 10th month. Ballottement after uterine delivery	21	Recovered after a tedious puerperium.
	?	IIc Abortive and operative findings	17	Ectopic fetus retained many years. Patient had 5 children. Ectopic fetus removed through posterior cul-de-sac.
lag.; none cor- l after expulsion e	?	IIc	22	Fetus (ectopic) expelled from abscess 6 months after delivery.
ected; the two as typical	Left tube	IIc Aborted 3 mos. fetus; 3 days later fresh 3 mos. ectopic found at autopsy	23	Rupture ectopic one day; abortion next; death, hemorrhage, 2 days later.
t suspected	Left tube	IIc Three months abortion: 3 mos. ectopic fetus at autopsy 2 days later	24	Abortion and tubal rupture practically coincident. Death from internal hemorrhage.
?	?	IIc "Both children were delivered to perfection"	25	"The first was expelled by contractions of the uterus but the second he took out of the abdomen by colpotomy."
rerlooked	Right tube	IIc Autopsy findings	17	Death from rupture of ectopic and internal hemorrhage. Also described by Tebbetts.
	Left tube and ovary	IIc Zinke's table	17	
verlooked	Right tube	IIc Autopsy	17	Both ova said to have come from right ovary.
	Left ovary and tube	IIc Zinke's table	17	
	Left side	IIc Zinke's table	17	Death due to peritonitis.
verlooked	Left tube	IIc Zinke's table	17	Ectopic fetus discharged by ulceration through vagina.
?	?	IIc	26	Fetus retained. Patient in good health 12 years after.
verlooked	Left tube	IIc Autopsy findings	17	Death from rupture of ectopic sac and internal hemorrhage. Both ova said to have come from same ovary.

No	Reported by	Year Occurred	Year Pub.	Age of Mother	Para	Duration of Pregnancy		Result to—			Diagnosis of Compound Pregnancy was Made
						Intra-uterine	Extra-uterine	Mother	Intra-uterine Fetus	Extra-uterine Fetus	
41	Sinks, T.	1870	1873	23	Multipara	6 mos.	4½ mos.	Died	Died	Not viable	Antemortem
42	Satterthwait, S. T.	1870	1872	35	III	9 mos.	9 mos.	Lived	Still birth	Died	Ectopic not recognized until ectopic fetus discharged from pus sac by vagina and rectum some months after still birth
43	Sale and Moore	1870	1871	22	0	9 mos.	9 mos.	Died	Lived	Lived	Before labor
44	Beach, J. H.	1870	1871	28	I	6 wks.	9 mos.	Lived	Abort'd	Died Retained Remov'd	Before abdominal section
45	Laudon, Henry B.	1870	1871	?	?	About 11 wks.	About 11 wks.	Died	Not viable	Not viable	At autopsy
46	Pollak, S.	1871	1871	25	II	9 mos.	9 mos.	Died	Lived	Died	At autopsy
47	McGee, J. J.	1872	1875	28	?	4 mos.	4 mos.	Lived	Abort'd	Not viable; discharged per rectum	Before abortion
48	Starley, S. F.	1872	1873	?	?	9 mos.	9 mos.	Died	Lived	Undelivered	After delivery of intra-uterine child
49	Hodgon, J. J.	1873	1874	27	?	9 mos.	5 mos.	Lived	Lived	Died Became Encysted	After delivery of intra-uterine child
50	Chabert	1874	1876	25	?	9 mos.	9 mos.	Lived	Lived	Died Retained for a time	Upon extrusion of ectopic extremity through umbilicus
51	DeRosset, J.	1876	1878	27	I	9 mos.	5 mos.	Lived	Probably lived	Died Later discharged	At discharge of second fetus
52	Dumollard, J.	1878	?	?	?	9 mos.	9 mos.	Lived	?	Died Retained	?
53	Brühe, L.	1879	1887	39	VI	8 mos.	6 mos.	Died	Died	Died	At abdominal section
54	Galabin	1880	1881	37	I	6½ mos.	6½ mos.	Died	Died	Died	At abdominal section
55	Wilson, H. P. C.	1880	1880	24	III	8 mos.	9 mos.	Died	Lived	Lived	At delivery
56	Piersons, A. M.	1881	1881	33	IV	2 mos.	2½ mos.	Died	Not viable	Not viable	At autopsy
57	v. Rossthorn, A.	1889	1890	36	XII	7 mos.	9 mos.	Lived	Died	Died	After delivery of uterine fetus
58	Harriman, A. H.	1889	1890	32	0	9 mos.	9 mos.	Lived	Lived	Died Retained	After delivery of uterine child
59	Ahlfeld, F.	1886	1886	34	I	7 mos.	5 mos.	Lived	Lived	Died	At 4½ months

Nature of Error in Diagnosis	Seat of Extra-uterine Ovum	Classification and Evidence	Bibliography	Remarks
Combination overlooked until ectopic discharged from pus sac	?	IIc	17	Ectopic fetus ulcerated through vagina causing abortion intra-uterine fetus. Death from sepsis.
Ectopic overlooked until discharged	?	IIc Discharged 9 mos. ectopic some months after still birth at term	27	Infection of ectopic sac evidently followed tedious delivery and "child-bed fever," which promptly developed.
Correct	Left tube	IIc Both children delivered alive	28	Ectopic delivered by abdominal sertion. Both children lived. Mother died. Septicemia.
	Left tube	IIc	17	Ectopic fetus delivered by abdominal section 4 years after abortion of intra-uterine ovum.
Overlooked	Left tube	IIc Autopsy findings	17	Death from rupture ectopic sac and internal hemorrhage. Both ova said to have come from right ovary.
Overlooked		IIc Autopsy findings	17	
Ectopic mistaken for retroverted pregnant uterus and not detected until fragments discharged		IIc Ectopic fetus discharged through the rectum after traumatism. Aborted fetus of same age	29	Discharge of ectopic occurred a few days after attempts at reposition.
Not detected until after delivery	?	IIc	17	Patient refused operation.
		IIc	17	Not included in Christer-Nilsson's list, although mentioned in bibliography.
Ectopic overlooked, mistaken for a tumor	?	IIc	30	Five months after delivery and some time after discharge of some fetal parts the remainder of ectopic fetus removed by abdominal section.
Ectopic suspected before normal pregnancy positive, then abandoned	?	IIc Decomposed 5 mos. fetus expelled from cervix 2½ mos. after delivery at term	31	Although this case is included by Zinke and Christer-Nilsson, history shows it to be somewhat doubtful.
?	?	IIc Statement of Christer-Nilsson		
	Left tube	IIc Clinical history and operative findings	17	Still birth. Macerated ectopic. Death following operation. Hemorrhage.
Rupture of ectopic mistaken for rupture of ovarian cyst. Ectopic considered possible	Right tube	IIc Recent 6 mos. ectopic removed by operation; 6 mos. abortion 3 days later	32	Placenta left attached to uterus. Uncontrollable hemorrhage from it, and death followed contractions of uterus due to premature delivery.
Correct when first seen at delivery	Right tube	IIc One living child delivered at 8 mos.; other living child removed by section	33	Mother died of sepsis. Case also reported by G. H. Boylan.
Ectopic overlooked because of abortion	Right ovarian (?)	IIc Abortion 2 months; products examined; autopsy showed ectopic fetus of 2½ months	34	
	Left tube	IIc Ectopic fetus delivered by abdominal section plus delivery uterine fetus	17	
?	?	IIc Zinke's table and Christer-Nilsson	17	
Correct	Right pelvis	IIc Ectopic body made out and heart sounds counted; uterine child delivered soon after	35	Ectopic fetus retained.

No.	Reported by	Year Occurred	Year Pub.	Age of Mother	Para	Duration of Pregnancy: Intra-uterine	Duration of Pregnancy: Extra-uterine	Result to—: Mother	Result to—: Intra-uterine Fetus	Result to—: Extra-uterine Fetus	Diagnosis of Compound Pregnancy was Made
60	Edis, A. W.	?	1898	?	?	9 mos	9 mos.	Died	Cranio-otomy	Died	At delivery
61	Martin, E. W.	1890	1892	40	IV	5 mos.	7½mos.	Died	Abort'd	Died	After abortion of uterine pregnancy
62	Worral, R.	1890	?	30	V	9 mos.	9 mos.	Lived	Lived	Died	Ater delivery of uterine child
63	Herzfeld, A.	1891	1891	33	II	9 mos.	9 mos.	Lived	Lived	Died	After delivery of uterine child
64	Dickson, J. A.	1892	1894	28	IV	2 mos.	2½mos.	Lived	Abort'd	Died	After abortion of uterine child
65	Kallmorgen	1893	1893	35	VI	6 mos.	6 mos.	Died	Died	Died	At autopsy
66	Franklin, G. C.	1893	1894	33	V	9 mos.	9 mos.	Died	Lived	Died	At abdominal section
67	Mathewson, H. P.	1894	1898	30	Multipara	9 mos.	9 mos.	Lived	Lived	Stabbed Died Retained	Two days after confinement
68	Mitchell, T. E.	1894	1896	30	Multipara	5½mos.	5½mos.	Died	Abort'd	Not viable	After uterine delivery
69	Pestalozza, E.	1894	1895	35	0	5 6 wks. ?	5-6 wks. ?	Lived	?	?	Before operation
70	Walther, H.	1895	1895	35	III	3 mos.	3 mos.	Lived	?	?	Before operation
71	Hirst, B. C.	1894	1894	?	?	4 mos.	6-8 wks.	Lived	Abort'd	Not viable Remov'd	At operation
72	Moseley, W. E.	1895	1896	?	I	3½mos.	3½mos.	Died	Not viable	Not viable	At autopsy
73	Ludwig	1896	1896	35	V	9 mos.	9 mos.	Lived	Lived	Lived	After delivery of intra-uterine child
74	Ligetti, J.	1896	?	33	V	10 wks.	10 wks.	Lived	Not viable	Not viable	After abortion of uterine fetus
75	Cragin, E. B.	?	1893	23	I	6 wks.	6 wks.	Lived	Not viable	Not viable	After abortion of uterine fetus
76	Müller, E.	1897	?	29	?	4½mos.	4½mos.	Lived	Abort'd	Not viable	After abortion
77	Jones, H. E.	1897	1898	42	Multipara	3 mos.	4 mos.	Died	Abort'd	Not viable	At operation
78	Desquin, Leon	1897	?	?	?	2 mos.	2 mos.	Lived	Abort'd	Not viable	After abortion
79	Desquin, Leon	1897	?	?	?	3 mos.	3½mos.	Lived	Abort'd	?	After abortion

Nature of Error in Diagnosis	Seat of Extra-uterine Ovum	Classification and Evidence	Bibliography	Remarks
Correct	?	IIc Statement both living at term	36	Case related by Edis while reporting his own.
Ectopic overlooked until after abortion	?	IIc Uterine abortion at 5 mos.; distinct fetal movements thereafter; 7 mos. fetus found at autopsy	37	After abortion ectopic thought to be intro-uterine. Later correct diagnosis with dissenting opinions.
	?	IIc Zinke's table	17	Ectopic fetus delivered by abdominal section.
	Right side	IIc Both fetuses alive at term	38	Ectopic fetus delivered by abdominal section.
Ectopic overlooked. Mistaken for retroversion with retained twin; later for cyst	Left tube	IIc Aborted at 2 mos.; tubal rupture 2 weeks later, in 2 more weeks tube and secundines removed by abdominal section	39	
Ectopic mistaken for ovarian cyst	Left tube	IIc Death from tubal rupture and hemorrhage; ectopic and uterine fetuses of same age	40	
Ectopic mistaken for sarcoma	In pelvis back of and below uterus	IIc Two full term fetuses, one ectopic, other uterine delivered by abdominal section; ectopic placenta still living	41	Hemorrhage from placenta likely began before operation. Proved fatal half hour after operation.
	Left tube	IIc Living child delivered at term: another living child remained in abdomen	10	Patient subsequently had 2 children and consequently appears in class I as well.
Correct. Made after abortion	Left tube	IIc Abortion and autopsy; both recent fetuses same age	42	Death of mother due to internal hemorrhage caused by separation of placenta from tugging of contracting uterus.
Correct. Before operation	?	IIc Operative findings	17	Abdominal section and hysterectomy.
Correct	Left tube	IIc At operatfon left ruptured preg. tube and preg. right horn of uterus found	43	
Ectopic overlooked. Mistaken for active inflammatory disease of adnexa.	Right tube	IIc Positive ectopic structures and abortive fetus	44	Self-induced abortion coupled with ecto ic; abortion masked ectopic
Uterine pregnancy overlooked. Ectopic recognized	Right tube	IIc Ectopic rupture; fetus removed by operatfon; at autopsy like fetus found in uterus	45	Death due to hemorrhage from rupture and shock of abdominal section
Combination overlooked until after uterine child delivered	Left side	IIc Living ectopic fetus delivered by abdominal section; uterine born alive	17	Fifth day after birth mother sent to hospital and living ectopic delivered by abdominal section.
?	Right utero-tubal	IIc	17	
	Tube	IIc	17	
Ectopic overlooked until after abortion	Right tube	IIc Four and one-half mos. fetus aborted; one of same age removed by section	17	
Ectopic overlooked because of abortion. Mistaken for neoplasm	Left tube	IIc Four mos. ectopic removed at section; uterine placenta said to have been found	46	"Evidently the fetus had been discharged with hemorrhage and clots, as we found nothing but a well-formed placenta of 2½ or 3 mos. development." May not this have been decidua? Ectopic removed by abdominal section; death from hemorrhage and shock.
	Right tube	IIc Abortive and operative findings	17	Ectopic ovum removed by abdominal section.
	Right side	IIc Abortive and operative (?) findings	17	Ectopic removed by abdominal section.

No.	Reported by	Year Occurred	Year Pub.	Age of Mother	Para	Duration of Pregnancy		Result to—			Diagnosis of Compound Pregnancy was Made
						Intra-uterine	Extra-uterine	Mother	Intra-uterine Fetus	Extra-uterine Fetus	
80	Mond, Richard	1897	1898	28	V	9 mos.	6 wks.	Lived	Lived	Not viable	At operation
81	Boyd, Mrs.	1897	1901	29	II	9 mos.	2 mos.	Lived	Lived	Not viable	Before operation
82	Royster, H. A.	1897	1897	34	II	9 mos.	9 mos.	Lived	Lived	Died Remov'd	After delivery uterine child
83	Kiriac	?	1898	?	?	?	?	Lived	Not viable	Died	?
84	Hermes	1898	1900	30	III	9 mos.	2 mos.	Lived	Lived	Not viable	2 months after operation
85	Miller, C. Jeff.	1898	1898	27	I	3½ mos.	3½ mos.	Died	Died	Died	At autopsy
86	Halley	?	1899	29	?	7 wks.	7 wks.	Died	Died	Died	At operation
87	Doktor	1898	1899	26	I	3 mos.	7 mos.	?	Died	Died	At abortion
88	Thomson, N.	1899	1899	36	III	2 mos.	2 mos.	Lived	Abort'd	Not viable	After abortion
89	Dittel	1899	?	40	Multipara	3 mos.	3 mos.	Lived	Abort'd	Not viable	At operation
90	Strauss, W.	1899	1900 1901	34	II	14 wks.	12 wks.	Died	Not viable	Not viable	Before operation
91	Zinke, Gustav	1899	1902	23	0	9 mos.	3 mos.	Lived	Lived	Not viable	At operation
92	Peck, G. S.	1900	1902	27	0	9 mos.	2½ mos.	Lived	Lived	Not viable	Suspected at operation
93	Belaustequi, E. F.	1900	1900	33	II	3-4 mos.	3-4 mos.	?	Not viable	Not viable	At operation
94	Cantwell, F. V.	1901	1901	27	II	6 wks.	3 mos.	Lived	Abort'd	Not viable	At uterine abortion after operation
95	Warneke, S. W.	1901	?	34	IV	9 mos.	6 mos.	Lived	Lived	Died	At operation
96	Engström, Otto	1898	1901	29	III	3 mos.	2 mos.	Lived	Not viable	Not viable	Suspected before, made at operation
97	Wetherill, H. G.	1901	1901	?	?	?	9 mos. ?	Lived	Abort'd	Died	At operation
98	Frederick, C. C.	1898	1901	?	?	9 mos.	?	Lived	Lived	Died	At operation
99	Elliott, J. W.	1901	1902	35	II	2½-3 mos.	Very Early 2 mos. ?	Lived	Abort'd	Died	At operation. Suspected before
100	Perkins, H. P.	1901	1902	26	I	2 mos.	6 wks. ?	Rec'd	Abort'd	Died	At operation

Nature of Error in Diagnosis	Seat of Extra-uterine Ovum	Classification and Evidence	Bibliography	Remarks
Uterine pregnancy overlooked until operation	Right tube	IIc Date of rupture and nature of products	47	Ectopic products removed at third month of uterine pregnancy.
A probable ectopic made doubtful by known uterine pregnancy	Right tube	IIc Two months ectopic removed by section; 7 mos. later child born at term	48	
Correct when first seen	Left tube	IIc Uterine child born alive; fetal heart sounds and movements detected thereafter	49	Nine mos. fetus delivered dead by abdominal section; placenta removed.
?	?	IIc One fetus aborted, other removed by cul-de-sac	50	Abstract only available.
Ectopic recognized. Uterine overlooked	Left tube	IIc Two months ectopic removed after rupture; 9 mos. child born	51	
Ectopic overlooked on account of abortion. Ruptured uterus suspected	Left tube	IIc Ectopic and uterine fetuses same age at time of abortion and tubal rupture; autopsy	52	Mother died from rupture and internal hemorrhage following intra-uterine manipulation a few hours after abortion.
Uterine not suspected	Isthmus of right tube	IIc Seven weeks' products found in uterus and abdomen at time of rupture and operation	53	Only proceedings of medical society; specimen presented and clearly described; mother died from rupture, hemorrhage and immediate operation.
Ectopic mistaken for inflammatory condition	Left tube	IIc Three mos. aborted fetus at 3 mos. ectopic	54	Ectopic fetus removed by abdominal section at end of 9 mos.
Ectopic not recognized until after abortion	?	IIc Abortion at 2 mos. Ectopic embryo removed through cul-de-sac	55	
Ectopic overlooked on account of abortion	Right tube	IIc Ectopic fetus (fresh) removed by section soon after abortion	17	
Correct	Right tube	IIc Ectopic found at operation; proved by microscope	56	
Combination overlooked. Ectopic mistaken for cyst	Right side	IIc Three mos. ruptured ectopic removed during uterine pregnancy	17	Ectopic removed by abdominal section; uterine weighed 9 pounds.
Ectopic recognized. Uterine suspected at operation	Right tube	IIc Two and one-half mos. fresh ectopic removed during uterine pregnancy	57	Uterine fetus delivered at term.
Ectopic mistaken for neoplasm	Tube	IIc Three mos. abortion and tubal rupture; 3 mos. ectopic found at operation	58	
Ectopic recognized, uterine consequently overlooked, though uterus seen at operation	Left tube	IIc Rupture; ectopic removed; uterine abortion soon after	59	
Uterine pregnancy overlooked until operation	Left tube	IIc Ectopic rupture and removal at operation of 6 mos. fetus during uterine gestation	60	
Uterine pregnancy only suspected before operation for ectopic	Right tube	IIc Ruptured tube with mole removed; aborted 1 mo. later	61	Abortion resulted from fall 1 mo. after operation, hence no connection with latter.
Ectopic mistaken for pelvic abscess	Right pelvis	IIc ?	62	Only society proceedings available; report somewhat confusing.
Correct	?	IIc ?	63	
Correct. Strongly suspected. Confirmed by operation	Ruptured left tube	IIc Operative and abortive findings	64	Uterine fetus found; ectopic fetus not found, but competent microscopic diagnosis made.
Correct	Ruptured right tube	IIc Operative and abortive findings	65	Ectopic products removed by operation one week after rupture; threatened abortion instrumentally completed.

No.	Reported by	Year Occurred	Year Pub.	Age of Mother		Duration of Pregnancy		Result to—			Diagnosis of Compound Pregnancy was Made
						Intra-uterine	Extra-uterine	Mother	Intra-uterine Fetus	Extra-uterine Fetus	
101	Kochanon	1901	1902	31	V	4 mos.	2 mos.	Rec'd	Abort'd	Died	Before operation
102	Phillips, Jno.	1901	1902	28	II	8 wks.	Very early	Rec'd	Abort'd	Died	After abortion, prior to operation
103	Vasten	19—	1902	?	?	9 mos.	?	Rec'd	Lived	Died	?
104	Vasten	?	1902	?	?	?	?	?	Abort'd	Died	?
105	Reifferscheid	1902	1903	26	II	9 mos.	3 mos.	Rec'd	Lived	Died	At operation
106	Hagens and Moorehead	1902	1903	33	V	3½ mos.	3½ mos.	Lived	Abort'd	Died	Suspected prior to removal of ectopic by colpotomy; confirmed by abortion 20 hours later
107	Morrison, J. B.	1900	1903	?	?	3 mos.	2 mos.	Lived	Abort'd	Died	At abortion one month after ectopic was removed by colpotomy not previously suspected
108	Morrison, J. B.	1902	1903	33	V	2 mos.	3 mos.	Lived	Abort'd	Aborted	At second abortion
109	Biehat	?	?	?	?	?	?	?	?	?	?
110	Mondy, S. L. C.	1902	1903	27	IX	6 wks.	? wks.	Lived	Abort'd	Died	From specimen after abdominal section
111	Moulonguet	1901	1902	28	II	9 mos.	4½ mos.	Lived	Lived	Died Removv'd	9 days after operation
112	Simpson, F. F.	1903	1903	24	0	9 mos.	2 mos.	Lived	Lived	Not viable Removv'd	At operation
113	Morrison and Jessett	?	1903	27	I	2 mos.	2 mos.	Died	Not viable	Not viable	At operation

Nature of Error in Diagnosis	Seat of Extra-uterine Ovum	Classification and Evidence	Bibliography	Remarks
Uterine pregnancy overlooked till operation	Tubal abortion, 2 mos.	IIc Operative and abortive findings	66	Ectopic products by operation; uterine fetus aborted 23 days later.
Diagnosis not mentioned prior to operation	Tubal abortion	IIc Operative and abortive findings	67	Operation soon after rupture; clinical signs confirmed by chorionic villi.
?	?	?	68	Only abstract available; may have been previously reported; ectopic removed by operation.
?	?	?	68	Only abstract available; may have been previously reported; ectopic removed by operation.
Ectopic diagnosed prior to operation. Uterine overlooked until operation	Left side	IIc Probably	69	
Suspected uterine. Ectopic correctly diagnosed	Ruptured right tube	IIc Operative and abortive findings	70	Ectopic removed by colpotomy at secondary rupture.
Uterine overlooked. Ectopic recognized	?	IIc Operative and abortive findings	71	
One fetus overlooked. Inflamed condition suspected	Right interstitial	IIc Abortive findings	71	Interpreted by author as twin pregnancy—one uterine, one interstitial. His description does not preclude the possibility of twin pregnancy in a uterus septus annealtes.
?	? Left tubo-ovarian	?	72	Only abstract available; no details of case given except that it was twin pregnancy combined intra- and extra-uterine.
Ectopic mistaken for inflammatory condition		I and IIc Abortive and operative findings plus dates	15	In 6 mos. four times pregnant in uterus and once in tube; third uterine and tubal probably coincident: while carrying ectopic products fourth intrauterine pregnancy lasted 6 weeks; pregnant twice subsequently, making 10 uterine pregnancies and 1 tubal in 2 years.
	Left tube	IIc Ectopic fetus removed during course; normal pregnancy	75	
Ectopic recognized, uterine recognized, and then interpretation of ectopic mass doubtful	Right ruptured tube	IIc History: rupture; ectopic at 2 mos.; products removed at 3d mo.; delivery at term 5 mos. later	76	Typical history of both conditions; combination not positive because considered so rare; ectopic removed by abdominal section; uterine gestation not interrupted.
Uterine recognized at operation	Left tube	IIc History of ectopic; ruptured tube and pregnant uterus found at operation	—	Personal communication

branch of medicine to give this subject proper recognition. The cases recorded have been so typical of the two conditions they illustrate that when the facts are all in we wonder how a mistake could occur. It should rarely do so when one has sufficient practice in pelvic examinations to recognize the *physical* conditions present; knows the course of ectopic, and the changes it constantly causes; knows the positive signs of pregnancy; and especially *knows that the two conditions not infrequently co-exist.*

Treatment.—The treatment of compound pregnancy is in many particulars identical with that of simple ectopic. It accordingly varies with the duration of the ectopic and the degree of its integrity. Its claim for recognition (such as rupture, hemorrhage, living fetus, visceral encroachment and complications, infection, etc.), together with the immediate and available surroundings and facilities, are factors to be determined. The patient's power to withstand the treatment or the disease, however, demands the greatest consideration.

It differs from the treatment applicable to simple ectopic by virture of the third life in question and the varying exigencies of its existence.

The products of ectopic gestation, living or dead, are a constant source of danger till removed by nature or the surgeon. Nature's processes, absorption, hermetic sealing, infection and casting off are often adequate. Especially is this true when the tender ovum is thrown into the abdominal cavity with relatively little bleeding as in tubal abortion and early rupture. This form of complete cure occurs in comparatively few instances. Even during this gradual course opportunity is afforded for further rupture and infection. Infection is usually due, of course, to adherent intestines. The way for rupture is prepared by continued growth, added tension and penetration of the sac. The actual occurrence of rupture is frequently determined by increased abdominal pressure from trivial exertion, or external violence. In compound pregnancy these forces are all made more active by the dragging and pressure of the growing uterus and by the tugging which results from emptying it prematurely, or at term. Obstructions to the birth canal and added avenues for infection further increase the mortality of this condition.

We therefore have greater reason for appropriate and timely surgical intervention in compound than in simple ectopic pregnancy. The vital questions are what is appropriate treatment, and when is it timely?

When taken in connection with the natural and operative history of ectopic gestation, the course and results observed in 112 collective cases of compound pregnancy afford a fair basis for the following conclusions:

In compound, as in simple cases, the ectopic is a source of grave danger. The ectopic fetus has rarely been delivered alive, and the ectopic child has more rarely reached maturity. In the conflict for life it should therefore be disregarded unless it is almost viable and the surroundings make delay safe. The greatest safety to the mother and her offspring lies in removing the ectopic products by abdominal section, preferably before any complications have occurred.[1]

As to the time at which operation should be done, in cases of rupture and hemorrhage, my views honestly, but rather widely, differ from those repeatedly expressed by quite a number of operators of wide experience and excellent results. My opinions are based upon observations on more than seventy cases, and I have tried to study them critically. Of that number, only three have been operated upon within a few hours of hemorrhage. Two recovered, one died. She would certainly have died without operation. I have seen but one die from hemorrhage. Though such an experience must be exceptional, in the main, it must accord with the observations of those who see the undisturbed cause of rupture.

I fully subscribe to the fact that some patients will die with or without operation. In some, but few, immediate operation is clearly imperative; in all, we should be *prepared* to operate on short notice. I cannot agree, however, with those who assert that without immediate operation, quite the majority of these women perish. On the contrary, I believe that many of those who recover from immediate operation, do so in spite of a hazardous procedure often hastily done under circumstances that could hardly be less favorable.

By preference, it has been my custom to defer operation until the patient has recovered from acute anemia. Very few examinations, and absolute muscular and mental rest, in some cases made more certain by morphine have been insisted upon as affording the best means of preventing continued or recurrent bleeding.

Report of Case.—M. S., twenty-four years old, nulliparous;

[1] In 21 cases thus operated upon 19 mothers and eleven uterine children lived. This record contrasts strikingly with results following other plans of treatment.

menstruation always regular. Her last period occurred December 20th, 1902; the January period was passed. After slight nausea for a few days, she had (February 19, 1903) sudden severe pain in the region of her right tube, which necessitated rest in bed. February 21st., Dr. Hays saw her and recognized the condition at his first visit. He promptly referred the patient to me. She was suddenly anemic, had a pulse of 120, and temperature of 103°. She had a tender mass the size of a small cocoanut in her right pelvis, and her uterus was slightly enlarged. She was immediately sent to the hospital and kept at absolute rest. In four weeks her temperature and pulse had about reached normal and her blood was about rebuilt. Examination showed what felt like the firm uterus well to her left and an elastic globular mass four or five inches in diameter behind and to the right of it. The uterus was irregularly contracted. At examination under ether, the left half of the uterus had relaxed. The purple cervix, soft lower uterine segment and globular elastic fundus gave unmistakable evidence of a three months' uterine gestation. The mass found in the pelvis thirty days before had been pushed up and to the right of the growing uterus.

The diagnosis of early ruptured tubal pregnancy had been made, and now it was equally clear that the uterus contained an early living fetus. Notwithstanding the fact that the two pregnancies were typical, and each in turn recognized, I am free to admit that this combination was considered so unusual as to be improbable at least. April 9th, after three weeks of normal temperature, the abdomen was opened to the left of the median line. When the stained peritoneum was cut through, a little free blood welled up. The omentum was separated from vesical and uterine attachment and the uterus, very nearly four months pregnant, was found lying rather to the left of the median line. Behind and to the right of it, extending a little above and dipping deep into the pelvis, was a sac containing more than a pint of clotted blood. This sac was of recent origin and was adherent almost throughout its entire surface to intestines, pelvic walls and uterus. It was shelled out from its attachments, delivered, and removed. Oozing was controlled. The abdomen was closed and convalescence was normal. The uterine pregnancy gave no other evidence of its presence than continued growth. Before the patient left the hospital, fetal movements and heart sounds were distinct. She returned to her home in Virginia, and through the kindness

of Dr. B. F. Weaver, I have learned that she was confined September 12, 1903. Mother and child are doing well.

Pathology.—The specimen removed consisted of the outer three inches of the right Fallopian tube, the right ovary, a tubal mole, an adventitious sac, and about a pint of clotted blood.

The tube consisted of a proximal portion, which was ½ inch long and appeared to be quite normal. A dilated portion which expanded from that just described, looking much like a sausage, one inch in diameter and two inches long.

The cavity was filled with what appeared to be old blood clots. At about the center of its upper surface was a ragged rupture ¾ inch in diameter. Protruding from it into the surrounding mass of blood clot was a tubal mole about 2½ inches in diameter, in the center of which was a small cavity lined by a delicate whitish membrane.

Distal to the dilated portion of the tube it was contracted for half an inch, and then the fimbriæ were clearly seen.

The cystic ovary protruded into the sac of blood clot, thus showing conclusively that rupture occurred into the free abdominal cavity, and not into the broad ligament.

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Von Schenk (83) refers to four cases of compound pregnancy which are not included for lack of data.

Vilsin (34) also refers to a case which is probably the one fully reported by Christer-Nilsson (61).

There yet remain a number of cases reported as compound pregnancies in which the available recorded facts do not constitute

convincing proof. Such cases are those of Detwiler (77), clearly a dermoid, Maxson (78), Behm (79), Cox and Coles (80), Grandin (81), Whitcomb (82) and Petrienti (86).

Thiernesse (85) reports a case of compound pregnancy occurring in a sow, the title and place of publication giving no indication that it was in a lower animal.

17. Cliet Heuri.—Occurred 1813, published 1818, age of mother and para not given, duration intra-uterine 3½ months, extra-uterine 6 months, first observed and hence diagnosis made on dissecting table, ectopic fetus and fluid blood from ruptured right tube, uterus still pregnant with 3½ months' fetus. As mother evidently died from ectopic rupture and hemorrhage, the fetus being of six months' development, it is clear that while both were living at same time, ectopic began first. (73.)

18. Edis, A. W.—Occurred 1889, published 1889, age of mother 38. I-para, intrauterine fetus four months, extrauterine five months, mother lived, living ectopic removed because of complex obstruction of bowels, report made while intrauterine still growing with little danger of interruption, diagnosis made before operation, fetus in left cul-de-sac. As ectopic was of five months' duration living, while uterus observed at operation was of four months' development, the ectopic would seem to have antedated uterine conception. (36.)

19. Argles, F.—Occurred 1870, published 1871, age of mother and para not given, intrauterine aborted at two months, extra-uterine seven months, mother died three months after death of ectopic fetus, abortion and death of ectopic coincident; diagnosis at time of abortion uterine pregnant overlooked until abortion, ectopic having been detected three months earlier, although mistaken for normal pregnancy; side, right tubo-ovarian; evidence, ectopic known to be alive a few days before abortion at two months. (74.)

THE TECHNIQUE OF GYNECOLOGICAL WORK.

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FEW among those present to-day have a better right to emphasize the fact that we belong to a progressive profession than myself: therefore, I have a reason for becoming somewhat reminiscent. When I think over the methods employed at the time I began to do the simplest gynecological work, such as repair of the perineum, operations for relief of cystocele, rectocele, intravaginal hypertrophy of the cervix (before the day of recognition of lacerated cervices), and doing it often in a small room, poorly lighted, on the edge of the bed, with scarcely any proper preparation of patient, I marvel that we secured any encouraging results.

Suppuration, pus, blood poisoning, each had their periods of victory, and not until the day of aseptic surgery did we fully realize how necessary it was for our patients to be properly prepared, with surroundings made more favorable for their recovery.

The writer remembers, in 1884, seeing the, then, leading gynecologist, come into his private hospital, say to his head nurse: "We will operate upon Mrs. B. at once, kindly send up the instruments," and, much to my astonishment, I saw the patient put under ether, turned to the edge of the bed, a nurse on each side, and the flap-splitting operation done for restoration of the perineum. Suppuration followed, and the operation was not a success, although rapidly and skilfully performed.

Let us look back but two decades and what are the factors that have entered into the success of this class of surgical work? Surely, it is not due so much to better anatomical knowledge or surgical operative skill, but to better understanding of surgical pathology and modern aseptic methods. Even if operating at the house of the patient what a contrast in the various steps that now carry our patient to recovery and successful results. Some may criticise the so-called "frills" that attach to clean surgery of to-day, but there can be but one answer and that is to compare the

mortality list of the old and present methods, and the reply will be, in the words of Whittier:

"Of all sad words of tongue or pen,
The saddest are these, it might have been."

To one who during a period of more than forty years has observed this great evolution in surgical practice, there comes before him moments of meditation filled with gratitude and gratification. Surely, we have reasons to rejoice, to increase our courage, and press on to even better results. I would say then let us give care-

Fig. 1.

ful consideration to the economical points in the preparation and care of our patients. In view of our present knowledge of auto-infection we cannot be too careful in relieving the alimentary canal, not leaving it in a condition of irritation, but doing just the right thing. Then, in the external preparation of our patients, in doing the operation, and in the use of dressings, it is our duty to protect them from unnecessary expense as much as possible. It is well known that clean surgery is somewhat, and can be made very, expensive. That is, it seems so at first to the patient, but when quick recoveries are compared with past long convalescences it is shown to be a fallacy. However, in our institutional work

it is often abused, and it is here, in the method of preparing our patients, in the use of material for cleansing external and internal parts, in the use of linen, gauze and dressings, over and about the patient, and field of operation, that I wish to say a word. The material, the making and care of suits worn by the operator and internes should be such as not to waste in being laundered. When one considers the vast amount of laundry work done in connection with a hospital of but two hundred patients, operators' suits, suits for the internes, nurses' dresses, linen outfits for patients,

Fig. 2.

Front. Back.

etc., we must respect the element of expense and be wise. I have observed that linen operating suits without buttons can be passed through the laundry with a marked saving in wear and tear.

Illustration No. I brings out some of the points I wish to emphasize. These trousers, which can be made of any material thought best, can be patterned so that the left side folds well over the right, and is held in position by three good safety pins. In this way we do away with buttons, button-holes and buckles. These garments will pass through the laundry without doing harm to the machinery, and require but little attention in the way of mending afterwards.

Illustration No. II shows the operating gown. The latter is shown rear and front view, also the bib is shown, often so serviceable, as it is easily applied over the gown, and where one is doing several operations in succession preserves the operator's garments aseptic and does not necessitate frequently changing the gown.

The gown is made in such a way that two or three safety pins, one at the neck, and one between the shoulders, are sufficient to hold it in position. It is fastened about the waist with good wide strips of linen, and tightened at the elbows with safety pins. In this manner wear, tear and mending are greatly obviated.

While great attention should be paid to the preparation of our hands, yet I am convinced that it is wise for us to become accustomed to the wearing of rubber gloves. They are now perfect in their construction, fit well, if properly looked after are thoroughly aseptic and economical for protecting the operator in

Fig. 3.

septic cases, and certainly in aseptic work are of great benefit to the patient. Should the arms at any time present a condition of dermatitis or irritation I am greatly in favor of using armlets made from non-expensive stockings or of simple knit cylinder goods.

As to the protection of the beard I do not think there is anything better than plain sterilized gauze, which can be removed as soon as the operation is over. However, with a beard kept well trimmed I am of the impression there is little danger of contamination from that source.

Surgeons should not use tobacco in any form, and all should take the very best care of their teeth.

Regarding the preparation of the patient, after a thorough bath I am satisfied that the use of the brush is not necessary, and, in many instances decidedly painful to the patient; therefore, in my

work I have ordered its employment discontinued, using it only for preparation of the nails, and possibly in preparing the scalp, the axilla and pubic regions.

In the use of green soap I much prefer the simple scrubbing ball made of a roll of absorbent cotton, Figure III, and covered not too tightly with gauze. This can be thoroughly sterilized and in scrubbing the parts is not so distressing to the patient. Turpentine and ether are used as necessary; alcohol after the parts have been thoroughly cleansed, and then a not too strong solution

Fig. 4.

Fig. 5.

of bichloride (from 1-2,000 or 1-5,000). Great care is to be exercised by the nurse in not producing a dermatitis by the scrubbing and use of the bichloride. If the operation is not to be done at once, but with a few hours to intervene, a warm pack of boric acid is applied by means of sterile gauze, with oiled muslin outside.

In vaginal work, when the patient is brought to the operating room, after etherization, and, as usual, placed in the lithotomy position, I have found a form of speculum, as shown in Figure IV of great service. This is made of hollow wire, perforated, as seen in Figure V, and the rubber tube of the irrigator attached

to the larger cylinder conveys irrigation, in this manner, to every portion of the vagina thoroughly well.

My attention was called to this instrument by Dr. W. G. Macdonald, a few years since, as an invention of his own, and I have found it of great value.

Here, in cleaning the parts, is a point for some consideration in the matter of economy. I have seen much green soap and alcohol wasted by its being poured from the bottle; therefore, I make use of two measuring glasses, Figure VI, each holding one-half ounce, just enough for thorough cleansing, pouring the soap into the vagina, and then using with proper bullet forceps, Figure VII, (a) sterilized bits of gauze. In this manner the

Fig. 6.

parts are to be thoroughly cleansed and irrigation kept up until everything is entirely aseptic. After this alcohol is used in the same way, thereby doing away with unnecessary waste, and with a much greater appearance of neatness at least. Then by douching the parts thoroughly well with a bichloride solution, from a large measuring glass or pitcher, we are prepared to proceed in our surgical work.

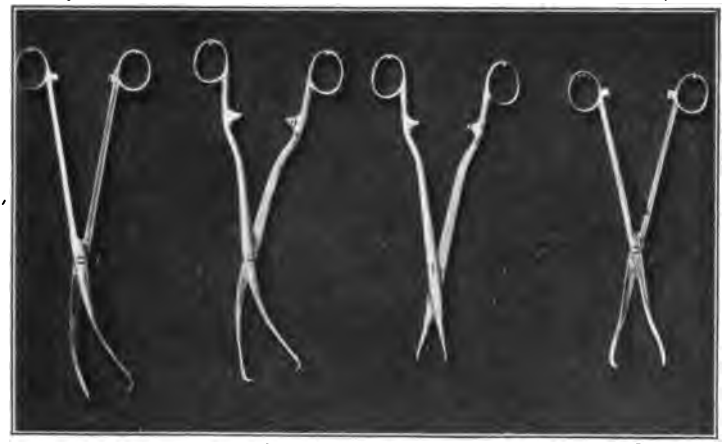
Figure VII (b), illustrates a form of forceps that I have found of value in trachelorrhaphy. It will be noted that one lip is slightly curved, and the surface serrated. This is introduced into the cervical canal and the volsellum blade outside. In this manner the proper width of the cervix is obtained, as you wish it after restoration is performed, using one for the anterior and one for

the posterior lip, gives a good chance for taking out the V-shaped portion of tissue and bringing the parts together quickly and nicely for use of the sutures.

Figures VII (c), and (d), simply show a double volsellum forceps and tenaculum, with good points, that may be used in various ways in operations about the vagina, but the fact I wish to make use of is not to employ the tenaculum in handling the bits of gauze, as the points will sometimes pass through, scratching the vagina, and doing harm.

When the patient is brought on the table, she wears long stockings or leggings, a clean undershirt of flannel, and outside a proper operating gown. In covering the extremities

Fig. 7.



a *b* *c* *d*

instead of using two sheets, as is often done, or a sheet with an arbitrary opening in the center, and which is apt to tear, and in being too small is sometimes an annoyance to the operator, I have instructed our operating nurse to prepare one sheet in the manner shown in Figure VIII, called a split sheet, leaving about two feet of the upper portion for covering the abdomen, and then each lateral portion is employed for covering the thighs and buttocks of the patient, safety pins being used, in this manner giving us the field of operation and leaving the patient well protected. This sheet is to be well hemmed and when properly made will pass through the laundry many times and not show much evidence of wear.

Every surgeon should see that his nails are kept well trimmed and they should be watched with care that no soft tissues collect to form what is ordinarily termed hang-nail. Here the nail brush is to be made use of and I am fond of a spud I have had made of steel, shown in Figure III (e). This is made blunt at the point, will clean a short nail thoroughly well, and is sharp enough to trim off soft parts, if necessary. This is kept sterile by boiling with other instruments, and I have found it very useful.

At the Albany Hospital we prepare our hands and arms as fol-

Fig. 8.

lows, and this is done equally earnestly whether we are using gloves or not:

1st. Scrub the hands and nails well with the scrubbing brush, the arms somewhat briskly with the gauze scrubbing ball, spending at least five minutes in doing this.

2nd. Apply to each arm and hand from one to two drams of spirits of turpentine, employ from two to three minutes more in using the gauze scrubbing ball, then plenty of hot sterile water and when all evidence of the turpentine has been removed make

an application of alcohol before using the bichloride solution 1-2,000 in the basin. Applying gloves at this time we are ready for the operation.

In operations about the vaginal outlet the single tenaculum is made use of for separating the vulva and for holding the mucous surfaces in cystocele and rectocele.

In the operation for cystocele and rectocele I am not quite clear that catgut is always best. A few interrupted sutures of silkworm gut, that can be removed afterwards, are quite proper. Silver wire, with or without the use of the split shot, is to be made use of in some instances, for in our earlier surgery we employed it successfully, and it is not to be forgotten or to be ignored.

Although this paper may seem somewhat like "carrying coals to Newcastle," yet I trust I have presented some few points, particularly in reference to cleansing the parts, wearing apparel for the operator and assistant, proper dressing of the patient, and the element of laundry work that may be the means of attracting attention to the economies of aseptic surgery.

ABDOMINAL SECTION DURING PREGNANCY, WITH REPORT OF SIX CASES.

By X. O. WERDER, M.D.,
PITTSBURG, PA.

It is now a generally accepted fact among abdominal surgeons that pregnancy is no contraindication to any necessary abdominal operation. This is particularly true of ovarian tumors. Gestation does in no wise alter their usual progress, nor does it interfere with the changes and complications to which they are frequently subject in the course of their development. Their growth is not retarded in the presence of pregnancy as has been taught, but probably rather stimulated and increased. Pregnancy, however, brings additional dangers to the patient suffering from an ovarian cyst, both before and during labor, and also in the delivery and the puerperium. Litzmann found among 56 cases with ovarian tumors only ten normal deliveries. Labor and the puerperal period seem to favor in a marked degree torsion of the pedicle, infection and gangrene of ovarian tumor. In my own experience peritonitis and serious infection of cysts have been observed during the puerperal period. According to Remy's[1] observations, twenty-three per cent. of the mothers succumb to the complications of ovarian cyst with pregnancy, under the expectant treatment. Swan[2] places the mortality even higher, at forty per cent.

It is, therefore, not a small matter to the safety of the mother whether an ovariotomy be delayed until after delivery, or whether prompt surgical intervention be adopted. In fact, delay and procrastination, for the reasons given, are far less excusable during the existence of pregnancy than in the absence of this complication, when we consider that the operation during pregnancy presents no more difficulties or dangers than at any other time. In one hundred and forty-six cases tabulated by Orgler[3] there

[1]Orgler, Zur Prognose und Indication der Ovariotomie während der Schwangenschaft, Archiv d. Gynecol., Bd. 65, p. 126.

[2]Swan, The treatment of solid ovarian tumors complicating pregnancy. Johns Hopkins Hospital, Rep. 1898, page 56.

[3]Ibid.

were four deaths due to operation or a mortality of 2.7 per cent., a result difficult to surpass in ovariotomies uncomplicated by pregnancy.

Of considerable interest and importance, in addition to the safety of the mother, is the effect of ovariotomy on gestation itself and the final delivery. In the one hundred and forty-two cases who survived the operation, as reported by Orgler, pregnancy was interrupted in thirty-two, or in 22.5 per cent. Statistics given by other operators give very nearly the same figures with the exception of those of Bovée.[1] He reports thirty-eight cases of removal of both appendages with one death and followed by abortion in only four cases, or 12.6 per cent. The removal of both appendages, therefore, does not only not increase the liability to miscarry, but seems rather to diminish it. The writer has no doubt, that if all cases could be operated on during the early months of pregnancy, before the size of the uterus necessitates extensive manipulations of that organ during the operation, very few pregnancies would become interrupted. When we consider that among Remy's three hundred and twenty-one ovarian tumors conplicated by pregnancy fifty-five or 17 per cent. aborted without operation, we must admit that the operation has very little tendency to interrupt gestation. In fact, the removal of one or both appendages exercises very little, if any influence on the pregnant uterus, and the complication of pregnancy, therefore, need not deter us from the necessary operative treatment. On the contrary, on account of the increased risks to which the patient is subjected, it should induce us to act all the more promptly.

While prompt operation is unquestionably the rational treatment for neoplasms of the ovary complicating pregnancy, tumors of the uterus, particularly fibroids, occupy a somewhat different position. They rarely jeopardize the life of the mother and seldom seriously interfere with the course of gestation and delivery. We may except, however, the tumors situated in the cervix or the lower part of uterus, which at times obstruct the birth-channel; and also submucous fibroids—fortunately not often accompanied by pregnancy—which may give rise to hemorrhages during pregnancy and delivery, and subsequently by sepsis and sloughing seriously endanger the life of the puerpera. Subperitoneal, and even

[1] Removal of both uterine appendages during pregnancy. (*American Journal of Obstetrics*, Feb., 1900.)

interstitial, fibroids of small or moderate size are usually harmless complications of pregnancy and require attention only when they produce marked peritoneal irritation, or by their rapid growth encroach upon the kidneys, digestive organs, or diaphragm. The author has observed many cases of fibroid tumors with pregnancy, but found indication for operation only in two. In several of them during the early months, while the uterus containing the fibroid or fibroids was still confined to the pelvis proper, crowding and packing it so completely that interference was seriously considered, all the symptoms subsided promptly, as soon as the fundus had ascended into the roomier abdominal cavity, and the pregnancy thenceforth pursued a normal course.

When a fibroid uterus during pregnancy produces symptoms of sufficient gravity to justify interference, emptying the uterus of the products of conception is hardly the proper procedure in the writer's opinion, because it does not remove the actual source of trouble, and because septic complications not infrequently follow abortions in such cases.

Hysterectomy, or, in favorable cases of subserous, particularly pedunculated fibroids, myomectomy seems to be the most rational and safest procedure. Each case of fibroid tumor complicating pregnancy must, therefore, be considered by itself, and no sweeping general rule can be applied to this class of neoplasms. The experienced judgment of the operator, as well as of the obstetrician may be required to decide upon the best course to be pursued in each given case.

The following report covers six abdominal sections performed during pregnancy, these being all the cases of this character coming under my observation, not including, however, Cesarean sections and ectopic gestations. Five of these were pelvic neoplasms, and one the removal of a firmly adherent, diseased ovary and tube, previously the seat of a large abscess which had been incised and drained. Three neoplasms were ovarian tumors, two of which were unilateral oophoritic cysts, and the other a dermoid of both ovaries, requiring the removal of both appendages. Two hysterectomies were performed for large multiple fibroids of the body of the uterus, which, after the fourth month of pregnancy, gave rise to very serious discomfort from their very rapid enlargement. All cases made very good, uninterrupted recoveries. None of the ovariotomies miscarried or even had any symptoms of miscarriage, though in one case the whole uterus had to be

turned out of the abdomen to gain access to a bleeding surface in the bottom of the pelvis. Three of them went to term and had normal labors and deliveries; and in one case no information could be obtained in regard to the subsequent course.

The period of pregnancy at which the operation was performed in the hysterectomies was at four and a half and five and a half months respectively, in one ovariotomy at six months, one at three and a half months, in the double ovariotomy at four and a half months, and in the salpingo-oophorectomy for diseased appendages between two and three months. The last one was the only case in which the existence of pregnancy was somewhat in doubt before the operation.

CASE I.—Double ovariotomy for bilateral dermoid. Mrs. E. B., referred by Dr. Koontz, New Kensington, Pa. Age 29; married six years; two children; labors normal.

Present Condition.—Has not menstruated for four and a half months; fetal movements and other signs of pregnancy. About six weeks ago was seized with severe pains in region of appendix and diagnosis of appendicitis made by attending physician. Admitted to Mercy Hospital, November 24, 1902.

Evidence of pregnancy of about four months confirmed on examination. Mass on right side in region between appendix and ovary and extending into Douglas's cul-de-sac. Round, firm mass in region of left appendages.

Operation December 7, 1902. Dermoid tumor of right ovary, firmly adherent, ligated and removed; appendix also removed, being involved in adhesions. Left ovary also contained dermoid, which was adherent and in delivering it, it was torn off its pedicle. The pregnant uterus was then delivered through the abdominal incision and wrapped in hot towels and the bleeding vessels secured in the pelvis.

The dermoid on left side measured 6 cm. x 4.4 cm. x 3.2 cm. By its anterior surface, it was adherent to bladder and to side of uterus; the pedicle seems to have been twisted as it was very slender, almost like a cord. The right dermoid measured 5.2 x 4 x 2 cm., was contained in the cul-de-sac and adherent there. Both contained hair, fat, etc. The appendix was elongated, thickened and adherent.

The patient was put to bed and a suppository of powdered opium given by rectum. She made an uninterrupted recovery and left the hospital within four weeks.

She was at home about two months when she developed sudden

and severe eclampsia which kept her in a very critical condition for about four or five days. The urine was fairly loaded with albumin and casts. The attack subsided under appropriate treatment and pregnancy went on to full term. The patient was then delivered of a healthy child in normal labor.

CASE II.—Mrs. G. B., referred by Dr. Shallenberger, Rochester, Pa. Admitted to Mercy Hospital June 10, 1899. Age 29. Family history negative. Always in good health; menstruation regular and normal. Married seven years. Never pregnant until now (three months). Six weeks ago fell from bicycle and hurt left side severely. On examination large mass can be outlined on left side of pelvis which is soft and elastic. Uterus enlarged to size of three months' pregnancy and displaced to the right side by the cystic tumor in the left.

Operation June 12. Removal of cyst size of adult head imbedded in adhesions of recent origin. Uninterrupted recovery and discharged from the hospital July 8, 1899.

Normal labor and delivery at full term.

CASE III.—Right salpingo-oophorectomy. Mrs. G. M., referred by Dr. Blessing, Pittsburg; 31 years old, one child, eight years old. Several years afterwards was confined to bed for several months with an abscess in right ovary, which was opened and drained per vaginam. Menses always irregular.

At time of admission had not menstruated for over two months. Complains of very severe pains in the right side, preventing her from getting about; these pains more severe during last months. Examination showed uterus considerably enlarged, fundus drawn over to the right side and firmly adherent there. Cervix soft and somewhat patulous; pregnancy suspected. On opening the abdomen the fundus was found imbedded in adhesions on the right side, the ovary and tube very firmly adherent to the floor of the pelvis and was enucleated with very great difficulty. The left ovary was also adherent, but when loosened from its attachments, it proved to be practically normal and was, therefore, not removed. The uterus showed undoubted evidences of pregnancy of at least two months. The patient made an uninterrupted recovery and was relieved of all pains. She left the hospital in four weeks in good condition. Having lost sight of her, nothing is known of her subsequent history.

CASE IV.—Ovariotomy at six months; very large cyst. Mrs. McG., referred by Dr. H. H. Clark; 30 years old; four children. Admitted to Mercy Hospital June 30, 1903.

About two months previously was called in consultation by her attending physician and found her suffering intensely along the right side extending from the margin of the ribs down to the crest of the ilium with marked tenderness on the slightest pressure. Every motion of the body increased the pains quite considerably. Palpation was so painful that no satisfactory examination could be made; but a distinct fulness and rigidity could be noticed in the right side of the abdomen, independent of the pregnant uterus, which could be pretty well outlined. The pain and tenderness subsided within a few days, but the abdomen rapidly enlarged after that, so that at the end of the sixth month she was unable to lie down on account of the enormously distended abdomen.

Operation July 1st. Ovarian cyst situated above and to the right of the pregnant uterus; anterior surface firmly adherent to the right abdominal wall just over the area at which the pain and tenderness were so very marked two months previously. All manipulations of the uterus were avoided during the operation, excepting when separating slight adhesions to its left wall.

The specimen consisted of large, thin-walled oophoritic cyst of left side. Contents measured three gallons. Patient made an excellent recovery and had a normal labor and convalescence.

HYSTERECTOMY FOR FIBROID UTERUS COMPLICATED BY PREGNANCY.

CASE I.—Mrs. G.; referred by Dr. J. J. Green. Admitted August 2, 1895. Age 34. Family history negative. Always in good health. Menses at 16, always regular and normal. Married two years; never pregnant until now, five months. Had been feeling as well as usual until about one month ago, but much worse during last week when, after severe physical exertion she developed severe abdominal pains.

Abdomen much enlarged, but irregular; round in shape; a hard mass, resembling fetal head, can be felt extending up to epigastrium; fetal movements very distinct and heart sounds audible. Consistency of tumor filling up the abdomen variable and contour very irregular; two or three hard masses can be made out connected with pregnant uterus.

Operation August 4th. Three large subperitoneal fibroids, size of fetal head attached to uterus. Suprapubic hysterectomy, removing tumor and uterus all in one mass without rupturing membranes. Patient made a good, uninterrupted recovery.

CASE II.—Mrs. C.; referred by Dr. Neff, Masontown, Pa. Age 39 years. Family and personal medical history negative. About two years ago noticed a gradual enlargement of the abdomen. No pain. Married five months. Last menstrual period a little over four months ago. Examination shows uterus enlarged to about four months' pregnancy to which were attached several subperitoneal fibroids of various sizes, filling up the abdomen to above umbilicus; suffering much from pain and distention during last month with inability to get around, discomfort increasing from day to day.

Operation May 12, 1903. Large number of fibroids of various sizes from pea to fetal head, contained in uterine walls. Attempt was made to enucleate larger ones with the hope of being able to save the uterus and fetus, but the hemorrhage was so profuse that I was compelled to do a supravaginal hysterectomy. The uterus was removed with the membranes intact.

With the exception of a slight phlebitis of the left limb, occuring at the end of the third week, she made an excellent recovery.

INTRAVAGINAL ELONGATION OF THE CERVIX.

By MARCUS ROSENWASSER, M.D.,
CLEVELAND.

PRIMARY elongation of the cervix is conceded to be extremely rare. According to Dudley (Dudley's Gynecology, III Ed., pp. 560-561), "The existence of genuine hypertrophic enlargement and elongation of the cervix is not absolutely denied; it is, however, of extremely rare occurrence. . . It is often apparent, seldom or never real." Hirst (Clin. Gynecology, Keating and Coe, Ed. 1895, pp. 234-235) says: "It is a curious fact that hypertrophy of the infravaginal portion of the cervix is much more common in negresses than in white women." He "does not remember having seen a case in the latter, while in his dispensary service it is a common experience to have several marked instances every year of this hypertrophy in negresses."

The case herein reported together with photographs and sectional drawing is one of moderate congenital enlargement of the vaginal portion of the cervix. I say "moderate," because the crude diagrams of the various text-books lead me to believe there are cases developed to a much higher degree. I have not been able to find photographs or accurate measurements of the cases hitherto placed on record.

Mrs. J. T. S., age 24, white, of excellent general health and good family history, has been married two years. She is sterile; her menses are regular, quite free, lasting four days, always attended by severe bachache and bearing down. There is no vaginal discharge; her bowels, bladder and urine are normal. Soon after marriage she noticed a small, hard lump drop down into the vagina. This has been gradually growing larger and now irritates the entrance.

On inspection the body protruding between the labia is easily recognized as the vaginal portion of the cervix by the opening in its center, which is of normal size surrounded by a small erosion.

Fig. 1.—Cervix exposed *in situ*.

On digital examination the vaginal fornices are found normal; the fundus is on a level with the symphysis pubis, but removed from it midway toward the hollow of the sacrum, constituting a retroversion of the first degree. Both ovaries, felt prolapsed in the posterior cul-de-sac, are enlarged but not tender. The uterus is freely movable.

On exposure by retractors, the vaginal portion appears of unusual length, of slightly increased thickness and density, having the shape of a truncated cone covered by normal mucous mem-

Fig. 2.—Cervix drawn up with bullet-forceps.

brane, and curved forward in the axis of the vaginal tube. Resting in the vagina without traction on the fornices, the length of the anterior surface of the cervix is one inch; that of the posterior, one and one-fourth inches, and of each lateral border, one and one-fourth inches. The sound enters the uterus three and one-half inches; its withdrawal is followed by a free flow of a transparent mucous slightly tinged with blood.

The usual treatment by curettage and amputation of the cervix was advised and consent obtained. After completion of the former operation (May 19th), while manipulating the cervix, I noticed that there was room enough in the pelvis to accommodate the cervix in its normal position in the hollow of the sacrum.

Fig. 3.—Antero-posterior section.

Under these circumstances I hesitated to mutilate the cervix by amputation. It seemed to me that if the vaginal portion could be retained in its normal position the chances of impregnation would be greatly enhanced, especially after curettage. In the event of pregnancy the elongated cervix would be included in the expansion of the lower segment of the uterus and in all probability, would be absorbed during the subsequent involution. Even if impregnation did not follow, protecting the cervix from circulatory disturbances and from sources of irritation, ought ultimately to lead to its atrophy. Instead of amputating, I therefore replaced the uterus and fitted a retroversion pessary.

Since the first fitting immediately after the operation I have changed pessaries three times, increasing the pelvic curve each time; thus bringing the cervix nearer to the sacrum. I have

found some difficulty in overcoming the tendency of the cervix to curve forward, a curve attained in its growth in the axis of the vaginal canal. The patient now wears the support without annoyance of any kind, and reports her last menstruation as being the first in her life without pain.

THE PALLIATIVE TREATMENT OF CANCER OF THE CERVIX UTERI, WITH REPORT OF CASES.

By WALTER B. CHASE, M.D.,
NEW YORK.

THE two chronic diseases which have been regarded as almost hopeless and have baffled the skill of the physician from time immemorial are cancer and tuberculosis. As peculiar to the reproductive organs of women that of tuberculosis has lost much of its dread and yields results to treatment most satisfactory, while the results in the management of cancer are most disheartening. Notwithstanding the studies and researches now going on as to the origin of cancer, which is enjoying the best scientific thought, our ability to grapple with the disease successfully is highly unsatisfactory. Extirpation, caustic applications, including electrolysis, seem to have about reached the limit of their curative efficiency, leaving us helpless in our remedial efforts. While these researches continue it is but reasonable that more efficient palliative measures be undertaken, and it is to this aspect of the subject as related to cancer of the cervix to which I invite your attention. Perhaps in most advanced cases antiseptic vaginal douches and the administration of opiates comprise the entire treatment.

The indications for palliative treatment will depend on the local involvement and the extent of the destruction of tissue.

In this form of cancer the first indication in palliative treatment is to get rid of all diseased structure possible. When hysterectomy is not indicated the area of ulcerative and infected tissue must be attacked. Conservative procedure does not necessarily indicate the removal of all the infected area. If this has passed beyond the cervix involving the vaginal walls, the broad ligament and adjacent structures it is better to limit the destructive treatment to the superficial area of ulceration. Cautery or caustic applications which result in opening into the rectum or bladder are to be avoided, as the resulting complications add to the discomfort of the patient. Usually the problem is how much of the diseased

structures can be removed and what is the best method. After observations and personal experience extending over a series of years I am convinced that no palliative measure is at once so easy and effective as that of the thermo-cautery. It matters little what the source of your caloric is as it relates to its efficiency. A well equipped galvano-cautery plant for hospital work leaves nothing to be desired. As between a portable galvano-cautery apparatus and the Paquelin cautery, circumstances will determine. The liability of most portable galvano-cautery batteries to get out of order is a serious embarrassment. It is never safe to begin a thermo-cautery operation with a single apparatus. I always have two, be they the galvanic or the Paquelin.

The late Dr. John Byrne, of Brooklyn, recently deceased, had developed this method to the highest degree of efficiency and his technique was perfect. It was largely to his skill and persistency that the efficacy of galvano-cautery was established. Those who knew him and witnessed his work appreciate and confirm the great value of his teachings. By the use of intra-cervical tenacula, associated with traction, he would not only amputate the cervix without hemorrhage but remove such a portion of the uterine body that what remained was a mere shell of uterine structure, embracing little more than its peritoneal covering. Another cause which I believe gives value and efficacy to this method of treatment, is that the heat of the cautery extends beyond the area of tissue destruction and is thereby efficacious in destroying the specific cancer cell. This method, when applied, as already mentioned, is usually bloodless.

The special skill consists: first, in not going beyond the area of involvement, and the avoidance of the bladder, rectum, ureters and intestines, and second, in having the cautery knife hot enough to burn the structures and not hot enough to disintegrate them too rapidly. If this is done troublesome hemorrhage may follow. Again the action of the cautery effectually closes the absorbent vessels thereby diminishing and arresting the infective process. I have seen patients far advanced with cancer of the cervix and showing signs of grave systemic infection, lose their cachetic appearance after thermo-cautery operations, and in the cases later reported I shall refer to this feature in their history.

Since resorting to the thermo-cautery method of palliative treatment, I have practically discontinued the potent caustics and escharotics, as steps in primary treatment. Occasionally they will

be of value, particularly in cases in which the patient declines the use of the thermo-cautery. The objections to and dangers from the powerful chemical caustics arise from the pain they produce, and the difficulty of limiting the area of the destructive energy, not infrequently involving normal structures and doing violence to the bladder, rectum and other organs which is irremediable. I desire to give special emphasis to the fact that it is quite exceptional for the patient to suffer pain after the use of the thermo-cautery, providing, however, the muco-cutaneous surfaces are not seared or burned. This requires tact and experience. I have usually found it easy to protect the vaginal surfaces from the injurious heat of the cautery by the use of strips of asbestos paper of proper size and shape. Where large areas of ulceration are attacked and the tissues are friable the curette may first be used to advantage. This is likely to result in pretty active hemorrhage. This bleeding is usually easily controlled by the application of pledgets of cotton applied with pressure, first dipped in dilute acetic acid, usually of half strength, or by the use of the adrenalin chloride. After this the cautery knife is to be applied at a dull red heat until the surfaces are thoroughly charred. The after dressing consists of 5 per cent. iodoform gauze, reapplied daily, after cleaning the parts with peroxide of hydrogen. In all manipulations of the cervix the greatest gentleness should be observed. Generally the use of bivalve speculi should be avoided as they are likely to impinge on the cervix and occasion hemorrhage. Dressing is best done with the patient in the Sims position and exposing the parts by a Sims speculum. The only exception is found when the posterior vaginal wall is involved. The slough separates usually in from one to two weeks. Daily dressing must be faithfully applied every day until healing follows, or should it not follow, its use must be continued to keep the parts as aseptic as possible. Where healing is imperfect, and unhealthy granulations reappear, they may be touched with carbolic acid or argentum nitras, pure or diluted as the case may indicate. As in granular surfaces generally the recognized healing power of nitrate of silver must not be forgotten. After the first day or two on removing the gauze the parts should be thoroughly douched by a solution of lysol ʒi to a quart of normal salt solution or the same amount of a 15 volume formalin ʒi to a quart, or a weak solution of tr. iodine. A variety of platinum knives both for the Paquelin and galvano-cautery are requisite. Also a dome-shaped instrument is

often useful. Added to this the patient should be placed under the most favorable hygienic condition and thorough alimentation and if need be alcoholic stimulants resorted to. Cheerful surroundings are required. Nothing acts more violently or disastrously as a depressant than the demoralization accompanying the disease and the solitude incident thereto.

In some cases the thermo-cautery may have to be repeated at intervals of 2, 3 or 6 months.

It may be suggested that such daily care as brings the best results, and without which they cannot be attained, involves the best nursing and the daily care of the physician. Such is the case. And without it the best possible conditions and results cannot be effected. It is worthy of notice that in proportion as the areas of ulcerative surfaces can be destroyed or lessened by the thermo-cautery, there is usually diminution or arrest of the pain. Sometimes this is followed by restoration to health for a longer or shorter period, and occasionally the disease is cured.

It might naturally be expected that in this discussion place should be given to consideration of the use of the Roentgen and the Finsen rays, and radium.

As regards their value in uterine cancer, it must be admitted our knowledge is largely in the experimental stage, and my experiences with the Roentgen ray and radium are insufficient to warrant the formulating of conclusions. The power of the Roentgen ray in breaking down and modifying the granulations of cancer of the cervix is pretty well established, but how far its curative influence extends will be decided after longer observation. I have had sufficient experience in the use of the Roentgen ray to know that much care must be exercised not to burn the cutaneous surface. This may be obviated by the use of a properly constructed screen, through which the rays are directed on the cervix, through the vagina. Sheet lead makes a good protector. Waite and Bartlett have such a device, which serves the purpose well. The susceptibility of the skin and the nonsusceptibility of the mucous membrane to burns from the apparatus seem well established.

Pain is so often present in cervical cancer as to demand special attention. That the acrid discharge irritates the ulcerating surface and so aggravates the suffering, goes without saying, and enforces the necessity of cleanliness and the use of proper local disinfectants. Sometimes the patient derives much comfort from solution of cocaine locally applied, or the cocaine may be mixed with adeps. Not infrequently rectal suppositories containing from one to two

grains of codeine with ex. hyoscyamus gr. ii, are helpful. With these topical applications resort must be had to opiates. Codeine in increasing doses, is the best until its power is inadequate for the relief of pain, when morph. sulph. may be substituted. The perturbing effect of morphia is sometimes very distressing, in which even the tr. opii deodorata may be employed. Under such treatment the suffering is reduced to the minimum, and the patient made as comfortable as possible.

One other condition, so often present in these cases, the demoralization of the patient as already referred to, needs to be guarded against, for oftentimes the mental solicitude of the patient concerning the outcome of the case constitutes her greatest suffering. Cheerful surroundings, the presence of a discreet and sunny-tempered nurse, who has the faculty of imparting unconsciously some of her confidence to the sufferer will aid in allaying fear. The attendant will find the widest opportunity for the display of skill and tact in securing and retaining the patient's confidence.

In the varying conditions of danger, whether from disease or operative interference, I have most often succeeded in quieting the solicitude of the patient by saying: "You have given me your confidence sufficiently to trust yourself to my judgment as regards treatment; now why not go one step farther and trust me for the results?" In this way I have often succeeded in getting the patient to throw off a solicitude which was detrimental to the highest degree. Certainly the patient should be made to feel that everything was being done for her welfare, which science and skill could offer. The function of allaying the injurious influence of fear is one of the highest arts of the physician and surgeon.

As illustrative of the results of palliative treatment I report briefly the following cases:

CASE I.—Mrs. ——, æt. 43, a patient of Dr. Nutt, of Woodhaven, entered the Skene Sanitarium March, 1901, with a cauliflower excrescence of the cervix as large as a man's fist. She had had no conceptions save those which resulted in miscarriage of which there were several.

This growth was reflected onto the vaginal wall antero-posteriorly and laterally, which forbade a primary effort at hysterectomy.

On March 14th I removed the growth by the galvano-cautery and amputated the cervix at the vaginal junction. The vaginal surfaces and uterine stump healed kindly, save a portion of the cervix about the size of a silver half dollar. On May 21st, fol-

lowing, she re-entered the sanitarium and I performed an abdominal hysterectomy.

Prior to this operation she was weak, anemic and in poor physical condition. Her convalescence was satisfactory. She was kept under monthly observation by her physician and in May, 1902, a year later, there appeared at the seat of the vaginal cicatrix a nodular mass rather larger than a silver 25 cent piece. At this time she entered the Memorial Hospital and I removed a button of structure, opening from the vagina into the peritoneal cavity the size of a silver half dollar. I examined her during this month and she is in perfect health with no sign of the return of the growth.

CASE II.—Mrs. ——, æt. 38, multipara, German, a patient of Dr. Fred. A. Cook, of this city, entered the Skene Sanitarium March, 1901, with carcinoma, involving the entire cervix and the disease had extended to the vaginal wall to such an extent as to exclude hysterectomy. I did a high thermo-cautery amputation. The parts healed kindly. Dr. Cook reported to me recently the patient was in good health.

CASE III.—Mrs. ——, æt. 46, German, multipara, a patient of Dr. Schaaf, of Newark, N. J. She dated her trouble to a miscarriage 17 years previous. She had a large, bleeding, ulcerating cauliflower excrescence of the cervix extending to the vaginal walls which nearly filled the vagina. The discharge was offensive and the patient's health was seriously impaired from the frequent hemorrhgaes. She entered the Memorial Hospital September 23, 1902, and on the 25th I removed the entire growth by the thermo-cautery. In two months' time it had healed, under daily dressings, save for a cup-shaped cavity ¾ inch in diameter and ½ inch deep. Her general health was greatly improved. Since that time she has had two other thermo-cautery operations, in Nov., 1902, and June, 1903. Since Feb. 3rd, the Roentgen ray treatment has been applied at intervals with the effect of modifying the condition favorably. The growth has broken down to a large extent and much healing has taken place, but symptoms of malignancy have not altogether disappeared. Her general health has been conserved, her life prolonged, and her condition that of comparative comfort. The value of palliative treatment has been demonstrated in this case, for without it she would not probably have survived the winter.

CASE IV.—Mrs. M., German, multipara, a patient of Dr. Fred. A. Cook, entered the Memorial Hospital September, 1902, with

carcinoma of the cervix. I did a high thermo-cautery amputation which was followed by perfect healing. About 3 months ago I examined her at my office. The uterus was normally movable and she was in excellent health locally and generally.

CASE V.—During March, 1896, Mrs. ——, a primipara, æt. 42, a patient of Dr. E. P. Crowell, came under my observation with typical cancer of the cervix, accompanied with extensive involvement. Hemorrhage was violent and she was cachetic. She was greatly exsanguinated and very weak. She entered St. John's Hospital in March, and I did a high galvano-cautery amputation. She made a slow but satisfactory recovery, as far as the healing and local symptoms were concerned and after two or three months she was able to resume her family duties. In November of the same year she entered the Bushwick Hospital for extirpation of a large Bartholin gland. At this time there was no sign of return of the cancerous growth. On June 16, 1897, she re-entered the Bushwick Hospital, being 7 months pregnant. The disease had returned, springing up around the old stump. After watching its behavior, I feared, from the hardening and infiltration of the uterine and contiguous structures, labor might induce rupture of the uterus, and on July 18th, at the eighth month of pregnancy, I removed the diseased growth, which encircled the uterine outlet by the thermo-cautery. No shock followed and she was delivered of a healthy living child on August 6th. Her convalescence from the confinement was satisfactory as was also the healing after the cautery. She enjoyed good health for nearly a year. Then the growth reappeared and she entered the Central Hospital, June 21, 1898, and I removed as far as possible the cancerous mass which had returned. She returned home August 25th. The healing was not satisfactory and she died a few weeks later from cerebral embolism.

There is one peculiarity respecting the results following the thermo-cautery operations for cervical cancer to which I desire to give special emphasis, viz., if there is no burning of the muco-cutaneous surface (which should be avoided as heretofore suggested), the pain is almost or entirely absent. So also these cases have, in my experience, been greatly relieved and sometimes the pain has disappeared, which was so tormenting before the application of the cautery.

The history of these few cases furnishes data from which you may all draw inferences. It is not claimed that any of them are permanently cured, though there is reason to hope in the first

and second cases the disease will not return. The time which has expired gives considerable promise. Further observation will fix the status of them and that of the third and fourth cases. While the treatment of none of these cases was undertaken with much hope or promise of permanent relief the present results are better than any other method of palliative treatment with which I am familiar.

Finally, I desire to state that palliative treatment is not urged or suggested to supersede radical treatment by extirpation, but rather as applicable in post-operative cases on recurrence, in cases which have passed the stage for successful attack and in cases in which the patient refuses any heroic treatment.

HYSTERECTOMY FOR INFECTIOUS DISEASE OF THE UTERUS AND UTERINE APPENDAGES.

By H. C. DEAVER, M.D.,
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THIS short paper which I have to contribute I base mostly on the knowledge and experience gained in my own practice. Perhaps in starting out it is best to consider the usual avenues of infection—namely: (1) By absorption into the vascular and lymphatic circulations from some focus of decomposition in the uterine cavity. (2) By direct infection from microorganisms introduced by the physician either in making examinations or in operating in the region of the uterus. (3) Gonorrhea.

The most frequent cause of infection, no doubt, is from decomposition of fragments of placenta, retained membrane, lochia or blood clots. The absorption of the toxins resulting from the decomposition of the above gives the symptoms known as sapremia. When the uterine mucosa has been injured, thereby opening up direct avenues for infection, sepsis may develop, spread at once, and infect the uterine appendages and peritoneum through the lymphatics.

When the infection has extended beyond the uterus surgical treatment of the intrauterine condition does not suffice, and where this treatment alone is practised it is very apt to aggravate the intrapelvic condition. As long as the infection is confined to the uterus alone, our efforts should be spent to prevent its spread; and this infectious condition should be met with by dilatation, curettage and drainage of the endometrium. In the majority of these cases this is a simple procedure. I have found it seldom necessary to exercise any force by use of instruments in dilating the uterine canal. I have always been able to dilate the cervix with my index and middle fingers; and by making pressure with my left hand above the symphysis pubis I thus fix the uterus so that I am able to easily empty it simply with my fingers. I am

in the habit of curetting the uterine cavity with broad-bladed forceps covered with iodoform gauze. I think we are less liable to injure the uterine mucosa by this procedure and believe it is less dangerous than the use of the sharp curet. Still, the sharp curet in careful hands, and its thorough application in properly selected cases, has been followed by prompt decrease in systemic poisoning and other grave symptoms.

Where the uterine wall is soft and boggy it is a very easy matter to penetrate it. I have seen cases, brought to me in my hospital experience, where the uterine wall had been penetrated in which there followed a purulent peritonitis and death. In one instance I recall a case where several feet of intestine had been pulled through the rent in the wall of the uterus and strangulated, with gangrene of the intestine following. The majority of cases of puerperal infection are due to the streptococcus, and the resulting invasion of the general system is rapid. For this reason this variety of infection offers a strong indication for early intervention, but we also know that the streptococcus germ in two or three hours may pass beyond the uterus where no curette can reach it. The serum therapy from a theoretical standpoint would seem the ideal treatment, but as yet I have found no value from it.

Unfortunately, this virulent infection is not limited to the placental site or wounded surface. After a time the whole endometrium becomes involved, clots in the uterine sinuses become infected, forming the condition known as thrombophlebitis. The uterine muscle may be riddled with pus through the infection of the uterine lymph spaces, and infection may take place also through the lymphatics of the broad ligament, producing a septic lymphangitis. As a result of this septic condition there is a peritonitis of greater or less severity, with the formation of lymph or pus on the free surface of the peritoneum. The ovaries are often involved through the continuity of the lymph channels, producing ovarian abscess. The fimbriated extremities of the Fallopian tubes become infected, producing pyosalpinx. The characteristic general result of this form of infection is septicemia.

Unfortunately, again, the remote lesions which we might expect from such a condition are septic pneumonia, endocarditis or nephritis. In such cases the post-mortem findings are pyogenic organisms in the walls of the uterus, the pelvic lymphatics, the blood vessels and the complicating foci. When the uterus becomes infected during examination or in operations the same

pathological conditions may take place, but not usually to such a marked degree. Fortunately, gonorrheal infections confine themselves chiefly to the endometrium and lining membrane of the tube; but, if infection reaches the fimbriated end of the tube a local peritonitis results, the tube becomes closed by agglutination of the peritoneal surfaces, and the result of the inflammation is at first purulent with the formation of purulent salpingitis. A greater or less degree of peritonitis is always present in these cases and all the pelvic viscera may become involved, producing dense adhesions. After the acute inflammatory symptoms subside the patient may be comparatively comfortable and apparently well for a considerable time, then there may be a renewed attack with a repetition of symptoms followed by the formation of strong and dense adhesions with involvement of the uterine muscle.

The symptoms arising from infection of the uterus depend upon the virulence of the infection, nature of the tissues attacked and the resistance of the organism to the absorption of septic products. The most common type of infection is the simple sapremia from the absorption of toxins produced by putrefying blood clots and retained secundines. The symptoms of infection usually appear about the second or third day after labor, but may not come on until the tenth day or even later. They are usually ushered in with a chill, fever rising from 102° to 104° F., with a pulse of 100 or more. On local examination the uterus is usually found to be tender over its body, with tenderness extending to one or both sides along the course of the broad ligaments. The early recognition of the condition and prompt operative treatment by the thorough cleansing of the vagina and uterus and establishing uterine drainage with iodoform gauze, together with drainage of the posterior cul-de-sac by free vaginal incision and the introduction of gauze, will usually arrest these symptoms and prevent further infection.

Where the infection has passed beyond the uterine cavity, involving the lymphatics and bloodvessels in one or both broad ligaments, in addition to these symptoms we have those of a pelvic peritonitis—namely, rigidity of the lower abdominal muscles with tenderness and distention. Vaginal examination reveals tenderness and rigidity of the vault of the vagina with induration, or a mass of exudate in one or both broad ligaments. It is in the latter class of cases that a fairly large collection of pus forms in the pelvis and lower abdominal cavity. Every one is agreed that here the surgical principle of giving exit to pus wherever and

whenever it exists should be adhered to, and yet, it is in these very cases that a conservative course finds its justification. If the collection of pus is so situated that it can readily be evacuated by an incision in the vagina, or above either of Poupart's ligaments, so that the peritoneal cavity is not entered, no time should be lost in making it.

The practice of aspirating these cases through the vagina I have always considered a most dangerous procedure, as the needle may enter a knuckle of intestine. A better procedure is to freely open the cul-de-sac by an incision through the vaginal vault and thus be able to see as well as feel. In a certain percentage of these cases the collection is so placed that it cannot be reached by either of these incisions. The fact that a pelvic abscess has formed shows that the inflammatory infectious process is localized and judicious delay is therefore not attended with any great danger. We know that the pus in acute puerperal sepsis is highly virulent and the slightest soiling of the peritoneum is almost certain to be followed by general septic peritonitis. I am in the habit of keeping these cases under close observation in the way of careful feeding and not purging them at all, but moving the bowels by gentle enemata, until the general inflammatory symptoms subside. If the pus collection is in the upper part of the broad ligament and if doubtful whether it can be reached by incision above Poupart's ligament, I make an incision in the median line at a point just above the upper margin of the mass. I first of all carefully inspect the relation of the mass to the abdominal walls and visceræ, then place gauze packing above and to each side of the mass, after which the abscess may be evacuated without danger of soiling the peritoneal cavity, and the collection mopped out with iodoform gauze, while exercising care not to destroy any adhesions.

Where the infection has passed into the tube forming a pyosalpinx or tubo-ovarian abscess, I always operate through the abdominal route, tying off the ovarian vessels as close to the pelvic wall as possible, and rapidly excising the tube and ovary with scissors, following the incision right into the horns of the uterus and closing the resulting wound with a continuous suture. I then drain with gauze, being especially careful to place the gauze along the line of sutures.

There is another class of cases, the most unfavorable of all, where the infection manifests itself as a phlebitis of the uterine sinuses and veins of the broad ligament, and is associated with small and multiple abscesses of the uterine walls, as well as with

acute peritonitis. Here the constitutional symptoms are pronounced; rapid and weak pulse, high temperature, with moderately distended, exquisitely tender abdomen, and with diarrhea. Associated with this infectious condition there is an endometritis giving rise to an offensive discharge, often blood stained. Local examination has here revealed a hot vagina, an enlarged, painful and movable uterus, which offers more or less resistance to touch, and this condition, with the absence of fulness in either the retrouterine or vesicouterine pouches is suggestive of infiltration. It is in this grave class of cases, which I have just described, that the question of hysterectomy presents itself.

If, in spite of the early treatment which has been outlined in this paper, the patient grows more profoundly septic, as manifested by the pulse, high temperature and general constitutional depression, and upon examination no exudate can be detected in the pelvis to account for increased septic manifestations, and it is, furthermore, evident to the experienced observer that the patient is losing ground rapidly, I deem it a justifiable procedure to open the abdomen and be guided by the condition there existing. In most of these cases it will be found necessary to perform total hysterectomy. I am convinced that an early operation can save some of these highly virulent and rapidly fatal forms of septic peritonitis. I would say that this grave pelvic condition is similar to the fulminating form of appendicitis, and surgical intervention, to be successful, must be prompt in this class of cases, just as it must be prompt in gangrenous and perforating forms of appendicitis without limiting adhesions, for a delay of some hours may turn the balance against a successful termination.

When infections of the uterus occur from gonorrhea and dermoid cysts and from intraligamentary and ovarian cysts, I am in the habit of performing a supravaginal hysterectomy. In the great majority of cases of gonorrheal infection, especially where there have been repeated attacks of pelvic peritonitis, adhesions take place between the surrounding viscera, and especially of the tubes and ovaries to the posterior layers of the broad ligaments, and these attachments are so dense and strong that it is impossible to dislodge them without tearing the posterior layer of the broad ligament, as well as the vessels therein. When we leave raw surface exposed we favor the formation of new adhesions to the omentum and intestines, which local mischief too often produces chronic invalidism, and at the same time exposes these unfortunate patients to the risk of intestinal obstruction, as well

as to a secondary operation. These remarks apply not only to infection from pyosalpinx, but to infection arising from dermoid cysts, suppurating ovarian and intraligamentary cysts.

Supravaginal hysterectomy in badly infectious cases with dense adhesions, I consider the ideal operation, for it thoroughly removes all of the diseased condition and we can leave the floor of the pelvis with a serous covering by neatly stitching the apposed serous surfaces together.

ECTOPIC PREGNANCY.

By HENRY DOWNER INGRAHAM, M.D.,
BUFFALO.

It is not so much my intention to present new facts in regard to the etiology or pathology of this somewhat frequent and very interesting condition, as to give a brief history of a few of my cases not previously reported, and to present the conclusions derived from their consideration.

Case I.—Mrs. M., American, age 30 years; menstruated first at 14; periods regular and normal; married ten years; two children, one 8, the other 5 years old; no miscarriages. Had missed two periods. Patient thought she was pregnant. Nothing unusual occurred until one day while reaching to adjust a window shade she was taken with severe lancinating pain in her left side. She was faint and dizzy and nearly fell to the floor, but managed to sit down. A few minutes later she was assisted to her bed. I was called to see her, and upon investigation pronounced the case one of ruptured ectopic pregnancy. She was removed to the hospital, and the following day underwent operation. Considerable clotted blood, debris, the left tube and ovary were removed. The patient made an uneventful recovery. A careful examination showed an engorged, thickened and enlarged tube, with an isthmus which was apparently smaller than normal. This was only apparent, not real, due to the enlargement of the rest of the tube. About the middle third of the ampulla, where the rupture occurred, the wall of the tube was thinner; the embryo in its sac had escaped from the tube and was found in the blood clots. There was no sign of previous disease of the tube; ovary healthy, containing corpus luteum of pregnancy.

Case II.—Miss A., American; age 23. A strong, healthy, well-developed young woman. Menstruated first at 12 years, always regular and normal in every respect. Had missed her last three periods. If she had experienced any unusual symptoms during this time she would not admit it. One morning about two o'clock she

was awakened by severe lancinating pain in her left side, accompanied by faintness, nausea and vomiting. There was also a slight bloody, shreddy, vaginal discharge. A physician was called who thought the patient was having a miscarriage. The next day she was more comfortable, and continued to be so for a week, but did not improve in any other respect. The bloody discharge continuing, the doctor thought she needed curetting, which he did under an anesthetic. Little debris was found, much less than the doctor expected. From this time on, the patient grew gradually worse. When I first saw her, nine days after the curetting, she had a temperature of 104°; pulse 120; anxious expression; abdomen very tender and sensitive; evidently suffering from sepsis. Bimanual examination revealed a large boggy mass at the left. and posterior to the uterus. I considered it a case of ruptured ectopic pregnancy. The patient was removed to the hospital and operated upon. A large amount of clotted and decomposing blood, the left tube and ovary were removed. The fetus, apparently about three months, was found just below the stomach. The uterus, which was slightly enlarged, and the right tube and ovary were apparently healthy. Patient made a good recovery. Examination showed a rupture of the tube at the outer end of the ampullary portion, which was very much thickened and engorged. Except where the rupture occurred, it was thinner than normal. The tube showed no sign of any previous disease. The ovary contained a corpus luteum of pregnancy.

CASE III.—Mrs. N., age 36; married when 23 years of age. Menstruated first at 14 years. Regular; periods normal after first few months; had never been pregnant, although anxious to have children. Suffered from vaginismus, for which she consulted me. A slight operation relieved this condition, and a little later she missed her period, and thought herself pregnant. I did not see her again for some time, when I was hurriedly summoned. the messenger saying that while at work she was suddenly seized with sharp, cutting pains in her right side, and it was necessary to assist her to bed. The pains continued in spite of the use of hot and cold applications. After examination I was satisfied that the cause of the illness was ruptured tubal pregnancy. Patient was sent to the hospital, and right tube, ovary and blood clots removed. The embryo was found enclosed in its sac in the blood clots, the rupture occurring in the middle of the ampullary portion of the tube. There was a sharp bend or kink in the tube at the middle of the isthmus, due either to defective development or old inflam-

mation, although there was no sign of inflammation, nor loss of epithelium present. Corpus luteum of pregnancy in ovary. Recovery of patient rapid.

CASE IV.—Mrs. L., age 29; married 8 years. One premature labor at 8 months two years previously. Had not been as well since. For a month past had experienced uneasiness and considerable pain in the right iliac region, which was increased when she attempted to do any work. For the past few days had been confined to her bed. Was frequently nauseated, but no faintness, nor pallor, nor fever; bowels constipated. Patient said that she had menstruated regularly and normally. I could not at any time get any history that indicated a ruptured ectopic pregnancy, nor in fact an ectopic pregnancy at any stage. A careful bimanual examination revealed a slightly fluctuating mass in the right side, about the size and shape of an ordinary lemon. I thought it was a pyosalpinx, and two days later operated at the hospital. Much to my surprise, I found a tubal pregnancy with rupture at the outer end of the ampullary portion of the right tube. Appearance indicated that the embryo which had escaped from the tube was five or six weeks old, although the patient said she menstruated normally one week before I saw her. Chorionic villi were found in the tube which had the appearance of a previous inflammation with loss of considerable epithelium throughout its whole extent. Corpus luteum of pregnancy in ovary. Recovery normal.

CASE V.—Mrs. G., age 30 years; married 8 years. Menstruated first at 14. Always regular and periods normal. One child three years old. Labor normal and had since been in good health. Had skipped two periods and thougnt herself pregnant. One afternoon was seized with severe cutting pains in the left iliac region, followed by faintness and a feeling of collapse. She was put to bed; her physician called, and in a short time was quite comfortable, although not able to be up. Two days later I was called and concurred in the opinion of her phyiscian, that it was a case of ruptured tubal pregnancy. She was removed to the hospital and the following day operation confirmed the previous diagnosis. Examination showed that the tube was ruptured at the inner third of the ampullary portion. No embryo was found either in the tube or in the blood clots. Chorionic villi were in the tube which showed no sign of previous inflammation, no corpus luteum of pregnancy in ovary removed. Patient made an uneventful recovery.

CASE VI.—Mrs. B., American; age 29 years; married 6 years; menstruated first at 15 years. Always regular. Sometimes experienced pain, not severe, otherwise periods normal; never had leucorrhea to any extent. Two children, oldest 3 years; youngest 6 months. Had been poorly for 3 months. Two weeks before I saw her she thought she had a miscarriage, and as a slight discharge continued, the uterus had been curetted. The discharge continued after the curetting, and the constitutional symptoms were more pronounced. I was called and advised her removal to the hospital, which was done. A large mass was discovered on the right side of the uterus, slightly tender. The patient gave no history that would indicate in any way that she had an ectopic pregnancy, either with or without rupture. She was, however, anxious to have the mass removed, whatever it might be. Operation showed that it was a case of tubal pregnancy. A few days after the operation the patient admitted that one night about two weeks previous she was very faint and could not get up the next morning; felt faint at times during that day. She had, in fact, been in bed ever since, although the faintness lasted only one night and day. She had previously denied any symptoms of like character probably through ignorance in comprehending the questions. A careful examination of the specimen showed that the fetus was in the infundibular portion of the tube and that tubal abortion had occurred; that the tube was not ruptured at all. This was probably the reason that she did not experience greater shock. Doubtless the tube could have been saved if it had been more thoroughly examined. Owing to the patient's condition, I did not think it wise to prolong the operation, and this was the only unruptured tube I ever removed. It was covered at its outer end with closely adherent blood clots and chorionic villi difficult to remove. No previous disease of the tube was discovered. Corpus luteum of pregnancy in ovary. Patient made a good recovery.

CASE VII.—Mrs. S., German; age 32 years; married 11 years; 4 children, oldest 9 years, youngest 2 years; no miscarriages; menstruated first at 13 years; regular and periods normal. Had passed two periods. One night, after a rather hard day's work, was suddenly awakened from a sound sleep with a severe pain in her left side; was faint and nauseated and vomited. The faintness and nausea continuing, the family physician was called, who thought it a case of ruptured tubal pregnancy, and advised her removal to the hospital. The next morning the doctor called me, and as I fully agreed with him, she was taken to the hospital

that day and the next day was operated upon. The tube had ruptured at the middle third of the ampullary portion, the rent being quite large. The embryo was found in the clotted blood. The chorionic villi were partially detached and remaining in the tube. Traces of an old inflammation of the tube were discovered. Corpus luteum of pregnancy in the removed ovary. Recovery uneventful.

CASE VIII.—Mrs. H, age 30 years; married 12 years; 4 children; oldest 10 years; youngest 3; menstruated first at 14 years, always regular after first year, and periods normal. Had passed two periods and supposed she was pregnant; had about the same symptoms as in her previous pregnancies. One afternoon, while at work, was seized with severe pains in right iliac region, was nauseated and faint, sat down in a chair as soon as possible, did not feel any better, and was assisted to bed and sent for her physician, who made a diagnosis of ruptured ectopic pregnancy. The next day I saw the patient and concurred with the family physician in his opinion of the case. The patient was removed to the hospital, and I operated on the following day. There was an unusually large amount of clotted blood in the abdominal cavity. The rupture, which was in about the middle of the ampullary portion of the tube, was small, the tube considerably thinned. The embryo was detached, but with the chorionic villi was retained in the tube. No previous existing disease in the tube. Corpus luteum of pregnancy in ovary; recovery uninterrupted.

CASE IX.—Mrs. G; age 23 years; menstruated first at 14; periods regular and normal; married six weeks. Had skipped one period before marriage and one since. Had always been in good health previous to this attack. Three weeks before I saw her, while eating breakfast was seized with severe, sharp lancinating pain in the left iliac region; was pale, faint and dizzy. She felt a desire to go to stool and was assisted to the closet by her mother, and had a slight movement of the bowels, but was not relieved of the desire to defecate. She had no further movement of the bowels until a few hours after taking a cathartic. Patient went to bed, and the family physician was called. The next day she felt very much better. She continued to improve, and five or six days after the attack she walked five blocks to the street car and went to one of the stores a mile and a half distant. She was taken worse while at the store and had to be brought home in a carriage and was again put to bed. This attack was similar to the first, but not as severe. She had spells of being better, then

worse, and soon became quite ill, so that when I was called to see her about eighteen days after the first attack I found her in bed with pain and tenderness all over the abdomen, but most marked on the left side. Pulse 100; temperature 102°. There was a mass as large as a fetal head at the lower and left side of the abdomen. I thought the case one of ruptured ectopic gestation and advised operation. Neither the patient nor the friends would consent, although I fully explained the danger attending the delay. I did not, however, explain the cause of her illness. I did not see her again for about ten days. In the meantime, two other surgeons had seen her and had advised operation, which she still declined. When I was again called I found her much worse in every respect; pulse 120; temperature 104°, and her general condition very poor. At that time the patient and her friends wished me to operate. I explained that the result would probably be fatal with an operation, and that it certainly would be so without one; that it should have been done when I first saw her. Even under these conditions they wished the operation, which was performed at the house. I think the operation did neither good nor harm. The patient rallied from its effects, but continued to grow gradually worse, and died four days later. The large mass of blood which was encapsulated had become infected. Examination revealed the chorionic villi, a previously healthy Fallopian tube, with rupture at the junction of the middle and outer third of the ampullary portion. The embryo was not found. Some of the blood was comparatively fresh, indicating that repeated bleedings had occurred. The corpus luteum of pregnancy was found in the ovary that was removed.

CASE X.—Mrs. P., age 31 years; American; married 13 years; menstruated at 12 years. Periods regular and normal until marriage. After that she usually experienced slight dysmenorrhea. Began to be poorly soon after marriage and had never been well since; never pregnant. Had pelvic pain and backache most of the time with more or less leucorrhea. Had missed two periods when I saw her, and two days before was taken with severe pain in the left side; was faint, nauseated and dizzy, and obliged to remain in bed. Examination showed quite a mass to the left and posterior to the uterus; right tube apparently thickened and tender. Diagnosis was ectopic pregnancy with rupture on the left side and salpingitis on the right side. She went to the hospital, and the operation two days later revealed the conditions expected. The debris was examined, showing that the rupture was in the outer

part of the ampullary portion of the tube. Rupture quite large with the escape of the embryo, which was not found; not a large amount of hemorrhage. The tube was thinned and showed signs of old inflammation and loss of epithelium; chorionic villi; corpus luteum of pregnancy in left ovary. The other tube being diseased was removed. The abdominal end of this tube was closed by adhesive inflammation and slightly distended by bloody pus. Nearly the whole mucous lining of this tube was destroyed by the inflammatory process. Recovery uneventful.

CASE XI.—Mrs. D., age 37; German; married 16 years; 4 children, oldest nearly 15 years, youngest 8 years; no miscarriages. Had missed one period and presented the usual symptoms of ectopic pregnancy including rupture which occurred two days before I was called. She was removed to the hospital and operated upon. Examination of specimen showed chorionic villi but no embryo; a previously healthy tube, with no corpus luteum of pregnancy in removed ovary. Recovery uninterrupted.

CASE XII.—Miss S, age 22; was seen by a very competent general surgeon who thought she had appendicitis; menstruated first at 14 years; always regular and periods normal; said she had been perfectly well in that respect. She was of good family and bore an excellent reputation. One night after going to bed as well as usual she was seized with very sharp, lancinating pain in the right side; was extremely tender and sensitive. The pain and tenderness, although not as severe the next morning, were still quite marked, and the doctor had her removed to the hospital. I was at the hospital when the patient arrived, and the surgeon told me that he was going to operate for appendicitis, and asked me to remain and witness the operation. Great was his surprise when he found a perfectly healthy appendix, but a ruptured right Fallopian tube, with considerable clotted blood in the pelvic cavity, all of which was removed. I was allowed by the operator to take what was removed for examination. The tube was ruptured in the middle of the ampullary portion. The rent was small; chorionic villi were found, but no embyro. The tube was thinned, but showed no sign of any previous disease. The ovary had a corpus luteum of pregnancy. About a week later I was allowed to question the patient, and she declared she had not missed a period. That it was time for her to menstruate when she was taken ill, and that the flow appeared that night, but not as freely as usual, and that it was more shreddy. She was questioned no further. Recovery of patient.

These twelve cases are the only ones that I have had in which thorough microscopical examinations have been made. I did not make the examinations myself. Had I done so, I should have had no faith in what was found. The work was done by reliable men, who were perfectly competent, and about the only result obtained was the demonstration of the fact that previously inflamed tubes are not the cause of ectopic gestation as frequently as is supposed. In nine of the twelve cases reported there were no indications of any old inflammatory disease, leaving only three in which there was previous inflammation of the tube. This certainly would not indicate that inflammation with loss of epithelium was necessary for the occurrence of this condition. I am well aware, that so small a number of cases does not establish anything, yet the lessons derived from them are valuable as far as they go. And when the results are so decidedly one way they cannot be ignored, even if the number of cases be small. Taylor[1] says: "In forty-three cases no certain evidence could be elicited of any pre-existing inflammation." Bland Sutton[2] is quoted as saying, "In many instances I have failed even after the most careful microscopical examination to find any evidence of old salpingitis or loss of epithelium." He further says, "In fact, a healthy Fallopian tube is more likely to become pregnant than one that is inflamed."[3] Martin[4] wholly rejects the inflammatory theory of the causation of ectopic pregnancy.

Orthman, Dührssen and Kustner[5] regard the inflammatory as the most plausible etiological factor. A kink in the tube due either to inflammation or congenital malformation is frequently ascribed as the cause.

In my cases there was only one that could be attributed to this cause. Mikulicz[6] reports ten cases out of a total of about thirty, due to obstruction of the passage of the ovum from mechanical causes. From what I have read, and more especially from what I have seen, it is apparent that the cause of ectopic pregnancy is still a mystery. All that is yet known is, that the impregnated ovum becomes arrested in its passage through the tube, and development of the embyro begins. The arrest may be due to one or more of several causes, some of which are yet unknown. I was unable to find any one cause in my cases that would stand the test of close scrutiny, except in case III, where the lumen of the tube was contracted.

In cases V and XI, as no corpus luteum of pregnancy was

found in the ovaries removed, they probably were cases of external transmigration.

In the cases reported, the symptoms were not the same, yet they have a similarity, so that a history of one would aid in the diagnosis of the others.

This is a subject of great importance, and I am well aware that I have not done it justice, yet in the brief time alloted me it is impossible to consider it in all its phases.

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[1]Quoted by Douglas in Surgical Diseases of the Abdomen, page 818.
[2]Ibid, page 818.
[3]Allbutt and Playfair, page 453.
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[5]Ibid, page 819.
[6]American Journal of Obstetrics, September, 1903, page 405.

CONSERVATIVE SURGICAL TREATMENT OF THE UTERINE ADNEXA.

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THE successful results obtained in gynecic and abdominal surgery since the founding of this Association have served to deepen the impression of the surgeon and to lead to a greater perfection of the work which he has to undertake. In the earlier attempts at such important methods of relief, the chief object appeared to have been to free the patient from present suffering, or to overcome the too glaring deformity with which the patient was troubled, without having always full regard for the ultimate preservation of the integrity of the organs or other parts, or for restoring as far as possible their normal functional activity. The same tendency had long been seen in the surgeon's adoption of the more radical measures in cases of operative treatment of diseased or injured parts, as of a finger, a hand, an arm, or of a leg. The surgeon, instead of resorting to a mere resection or excision of the affected portion, had not infrequently recourse to complete amputation for insuring a more speedy cicatrization of the damaged tissues involved. The present sentiment of people and the changes that are now everywhere fast taking place in the mental constitution of the races, call for a greater discrimination to be made in the choice of the procedures to be adopted by the surgeon, as well as in those to be employed by the physician.

I might in this connection further say, that the views now taking place among all mankind are not likely to prove of an ephemeral or a transient order, for the hidden mysteries of nature that are fast being unfolded must inevitably exert an important influence on the surgeon in determining his methods to be employed for the patient's relief. The multiplicity of important financial, as well as the social, positions that woman is now being trained to fill, besides property interests that are bearing more and more on the marriage relation, will also have to be taken into considera-

tion by the surgeon, that his patient may not gain the thought that she may become unfitted as a competitor for the prizes in the race that often seem not far distant before her. Without going further into a general consideration of this discussion of conservative methods of treatment, the following record of the management of cases is herewith presented.

The case of one patient was of a hitherto unsuspected tubercular condition of the Fallopian tube. The attack must have been of primary origin. There had been, from time to time, much severe pain along the genital tract. The patient had suffered also from severe dysmenorrheal attacks which could not be fully relieved by the ordinary methods of treatment, including rapid dilatation of the cervical canal and thorough curettement. Abdominal section showed that only a limited portion of the right Fallopian tube near its fimbriated extremity was involved. It was therefore deemed best to free the adhesions, straighten the tube, and to remove only the part that had become diseased. The incised surfaces of the peritoneal tissue were turned in and were sutured with material consisting of fine aseptic kangaroo tendon. Recovery was speedy, with complete relief from the painful symptoms.

One case operated on was that of a preternaturally long vermiform appendix, that had become adherent to the right ovary. There was a small ovarian cyst which was found in connection with the adhesions to the appendix ceci. This was removed with upward of one-half of the ovary. The patient recovered from the effects of the operation and was afterward free from pain and other discomforts. Two years later she married. She subsequently gave birth to a well-developed child (1901). The cause of the pain seemed to have been due to the adhesions of the vermiform appendix and the consequent dragging and to the inflammation that had been set up about the seat of the cyst and the accompanying adhesions.

Another case presented itself, in which the left tube and ovary had to be removed on account of two adjoining cysts of granular formation; there was also on the right side a small cyst which necessitated the removal of one-half of the ovary of that side. The patient recovered without meeting serious drawbacks. Three years afterward (1900) she became pregnant and went on to full term.

Two more cases operated on were for fibroids of the ovaries; in both cases there had been much pain and more or less menor-

rhagia. The growths, however, were quite small. Celiotomy in the first case showed that the growth was evidently the result of an extension from a uterine fibroid of about the size of a hen's egg. The mass involving the left ovary was also small, but it was thought wisest to enucleate it; in doing this it became necessary to cut away fully one-half of the ovary. The patient recovered and was practically free from pain and vascular and nervous disturbances. The fibroid in the second case was sessile and was in the outer half of the right ovary. About a third only of that ovary was left after the removal of the growth. The patient rapidly recovered and was afterward entirely free from pain and menstrual disturbance. Her age was twenty-six years.

The next to report was that of a tumor of the right ovary. There had been more than usual reflex disturbances and other suffering than that which would seem to arise from such a cause. The patient's age was thirty-one years; she was married and had had one child. Abdominal section revealed a distinctly hard mass about the size of an English walnut. The mass could not be enucleated as there was no defined capsule. Excision, including the lower and anterior three-fourths of the ovary, appeared to be the best method of operating for relief. Microscopic examination proved the mass to be made up of a round-celled sarcoma. The left ovary and tube were normal. Though I had at the time some misgivings as to the result, the patient, nevertheless, recovered perfectly; no return of the symptoms has been experienced since the operation, which was done over three years ago.

The next that I can report from my notes is an account of seven cases of conservative treatment of the adnexa undertaken because of inflammatory conditions. In two of the cases the patients were aged twenty-three and twenty-seven years, respectively. The first had been married four years and had given birth to one child. A year afterward she suffered from pyosalpinx on the right side. Abdominal section revealed an adherent and bent Fallopian tube, an inch and a third from the fimbriated extremity. The tube at this point was firmly bound to the under aspect of the ovary. So strong had the false connection become that it was found necessary to incise as far as the bend in the tube. The tube was then disinfected first by the use of sterilized water, and then with a mild sublimate solution. The left tube was adherent, but was easily freed from its adventitious bands; it was disinfected in the same way as the other had been done.

Two very fine animal sutures of tendon were passed through the outer wall of the left tube into the peritoneal tissue away from the point of adhesion. The patient recovered and did not subsequently complain of pain or of other discomfort. Two years later pregnancy took place and it went on to full term. The patient, aged twenty-seven, as mentioned, had a purulent condition (gonorrheal) of the left tube. The ovary on abdominal section, except being swollen did not seem so far advanced in disease as to justify its removal. The fimbriæ of the tube were easily freed from their adhesions, the tube was cleansed by the use of sublimate solution and iodoform. The tunica albuginea of the right ovary was found to be much thicker than normal and the ovary itself had become edematous from the inflammation. A granular cyst of the size of a large cherry had to be removed; nearly two-thirds of this portion of the ovary had to be cut away. The incised parts were closed in by the use of fine continuous aseptic tendon sutures. The tube was next disinfected by sublimate solution and peroxide of hydrogen. There was found near the uterine extremity of the tube a sacculated condition of the tube containing pus. The sac was nearly an inch in depth. As this could not be readily cleansed it was deemed best to excise the projection and to suture the wall by continuous sewing as was done with the incised parts of the ovary The patient rather against expectation recovered well from the operation. She has been well since that time which was over two years ago.

Of the other six cases of conservative surgical treatment of the uterine appendages, three were those of inflammatory conditions of the tubes on both sides; in one case the left Fallopian tube had become so disintegrated at its distal extremity (impermeable) as to necessitate incision for a third of its extent. The ovary of that side had been partially infiltrated with serous fluid. The ovary on the right side was cut into for the removal of a hard mass of about twice the size of a garden bean. The tube was not interfered with. Since the patient was only twenty-nine years of age, it was not thought wise to do more than was absolutely necessary. The operation was productive of much relief. The other two of these three cases were also treated through an abdominal incision; one was for the removal of a small growth on the left ovary which proved to be an adenosarcoma. A considerable portion of the ovary had also to be excised in connection with the cutting away of the growth. The tube on that side

was merely loosened from its adhesions. The ovary on the right side was perfect, but the tube was thickened, twisted, and adherent; it appeared, therefore, doubtful as to its being in any degree capable of proper function. It was left, nevertheless, with a slight hope that the remaining portion of the left ovary might be of service. More than a year has passed and the patient has been comparatively free from the severe suffering which she had endured before the operation. In the third case of this number the treatment was for double pyosalpinx. The left tube and ovary were wholly removed; the right Fallopian tube was not excised, as it was not unduly twisted or deformed. There was a projection or an abnormal point on the right ovary which appeared to be the result of a former hemorrhage into a ruptured or collapsed ovarian cyst of that side. This was excised all round until normal ovarian tissue was reached. The patient has since the lapse of two and a half years been entirely well.

The treatment in the other three cases was principally for the liberation of the adhesions of the appendages, occurring as the result of salpingitis, though it became necessary in one case to incise a disintegrated portion of the fimbriated extremity of the left Fallopian tube. In the two other cases the right tube in one, and the left tube in the other, had to be cut into, in order to overcome the occlusion and to facilitate the means for disinfection; closure of the incised surfaces of the tube was done by continuous suturing.

In the first two cases of this number the results were excellent, in the last, however, the relief was only partial. It will be observed that the number of cases operated upon by conservative measures was thirteen, and that among the favorable results obtained, three were cases of pregnancy following the procedures of surgical treatment.

Of eight other cases since met with, three were operated upon to overcome the effects of inflammation of the Fallopian tubes; one was treated by partial excision of the right and the other by that of the left Fallopian tube. One of the eight cases proved to be of tubercular origin, occurring in the right ovary, necessitating its removal. In two cases abdominal section was resorted to for cystic disease of the ovary. One of these was single and was on the left side; the other was multiple, but the cysts were small and occurring on the right side.

Of the other two cases in which operative measures had to be

undertaken, one was for pyosalpinx of the left side, and the other for an ovarian dermoid.

As the time has been more recent since the surgical procedures were undertaken, a full report as to benefits occurring cannot now be stated, though, as yet, no untoward sequelæ have been noticed.

ABDOMINAL VERSUS VAGINAL HYSTERECTOMY.

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CANCER of the uterus is the most insidious and deadly malady of the female genital tract that the surgeon is called upon to treat. Carcinoma in the female occurs more frequently in the uterus than in any other organ or part of the body and affects the cervix in about 90 per cent. of the cases. Unfortunately, many of the women afflicted with this disease suffer from symptoms ill defined, and are free from pain and with but little discharge until the growth has become so extensive as to involve the broad ligaments, the bladder or the vagina. For these reasons the family physician is often unaware of the real nature of the disease in question until all hope of successful surgical intervention has gone.

It cannot be too strongly impressed upon the general practitioner that irregular bleedings from the uterus, whether before, during or after the menopause, should be viewed with suspicion and thoroughly investigated. No feelings of delicacy should prevent an inspection of the cervix and palpation of the uterine body, nor a fear of consequences deter resort to curettage in suspected cases with examination of the scrapings for malignancy. A negative finding by the pathologist should be accepted with great reserve and not allowed to controvert unmistakable clinical symptoms, especially in a woman approaching or passed the menopause. I emphasize the latter because, as is well known, epithelioma rarely begins until after the childbearing period. Many of the cases of supposed hemorrhagic endometritis, with a malignant family history, would be better for a complete hysterectomy. It is the practice of the writer to do a complete removal of the uterus in hemorrhagic endometritis under the circumstances referred to. The question of removal of normal ovaries with the uterus need only be considered when the patient is comparatively young and the disease confined strictly to the uterus and

is in its incipiency, when it is the writer's practice to leave one or both.

In cases of hemorrhagic or hypertrophic endometritis with foul-smelling discharge, curettage should be practised and the findings examined microscopically. A negative finding by the microscope is not to be considered as an argument against the value of the same as an aid to diagnosis, merely indicating that the curette may have escaped the cancer area or that the latter was situated within the uterine muscle.

In discussing the operative treatment of carcinoma of the uterus we must remember that the surgeon too often does not see the case in the early stages, and must decide whether an operation is feasible and what the chances of eradication of the growth will be.

The cervix is the most common site of cancer, which is usually squamous celled, and in the beginning is essentially a local process, hard and indurated, and with papillæ elevated from the mucous membrane. As these papillæ increase and enlarge, the cauliflower-like growth so often felt becomes apparent. Ulceration and necrosis follow and the crater-like condition, also too well known, may be felt. In the latter stage the vaginal vault becomes implicated, the broad ligaments, the uterus, the bladder and the rectum involved, and, of course, radical treatment can be of no use.

By the surgeon the question must always be considered, whether the excision of the cancer area can be performed by section through normal tissue. Palliative measures for the relief of the discharge, the bleeding or the pain are better done by local measures than by the use of the knife.

To determine the indications for operation a most careful bimanual examination is necessary. If the uterus is adherent and fixed in the pelvis, the broad ligaments extensively infiltrated and the vaginal vault involved, operation is inadvisable. In my judgment the removal of the greater part of the vagina is inadvisable. Cases where there is such involvement of tissue as to require so extensive an operative procedure do much better by thorough curettage and cauterization, repeated if necessary. Recurrence will surely occur in this class of cases, and when the radical operation has been performed, new channels, for the extension of the cancer, are opened up. I have found that the pain consequent upon the recurrence of the growth following late and extensive operation is greater than in those cases curetted and cauterized. It is always difficult, however, to decide accurately the extent of

the growth, especially in cancer of the cervix, and therefore where reasonable doubt exists an exploratory operation can be decided upon, and the radical operation performed as being the most conservative, whether the carcinoma is located at the cervical or at the fundal end. In the early stages a complete removal of the uterus, broad ligaments and lymph channels in the latter should guard against recurrence with reasonable security.

The decision whether to perform the ablation by the vaginal or by the abdominal route will depend in the early stages upon the particular predilection of the operator. Personally, I strongly oppose vaginal hysterectomy for carcinoma of the cervix uteri, except in the presence of obstacles necessitating such a course. For instance, a very stout abdomen, nephritis, or old age. It is the practice of the writer to do a complete hysterectomy by the abdominal route in fundal as well as in cervical carcinoma. The vaginal operation offers no advantage over abdominal section when the latter is properly and intelligently performed, and suffers from the imputation of being an incomplete operation, dangerous to the ureters and liable at any time to give rise to severe secondary bleeding.

The abdominal operation offers an increased space for necessary manipulation, greater security against hemorrhage and less risk of injuring the ureters. In the Trendelenburg position the field of operation can be kept constantly in view and by gauze packing the intestines are kept out of the way of injury and infection. In abdominal hysterectomy we are better able to keep beyond the area of diseased tissue, a larger portion of the broad ligaments together with their lymph channels can be excised and individual glandular enlargements noted and removed.

Injury to the ureters is not so likely to occur in the abdominal route on account of the better exposure of the structures. While expert operators have occasionally severed the ureters and the introduction of catheters makes any pelvic operation safer. yet I confess I have never introduced them for this purpose. It is usually claimed for abdominal hysterectomy that a thorough dissection of the pelvis can be made with the removal of the infected glands. The lymphatic system of the uterus consists of a rich network of vessels, those from the vagina and lower portion of the cervix following the uterine vessels to glands at the bifurcation of the common iliac arteries, usually three in number, and thence pass upward. The lymphatics from the body of the uterus anastomose with those of the cervix uteri, travel

downward to the deep inguinal glands by way of the round ligaments and pass through the utero-ovarian ligaments emptying into the lumbar glands. Yet, with this abundant lymphatic supply, carcinoma of the uterus spreads by continuity of tissue more readily and rapidly than through lymphatic metastasis.

I do not believe that the necessity exists to dissect out the iliac glands, as the additional mortality from operation is not repaid by a lessened recurrence. Such enlarged glands as I have removed have been found to be inflammatory and not malignant, and in the event of cancer of these iliac glands the case has become incurable by reason of extensive infiltration of tissues adjacent to the uterus. Extension downward into the vaginal epithelium, forward into the bladder and backward to the rectum, is much more common than metastasis into the pelvic glands.

Epithelioma of the vagina is sometimes overlooked as a point of metastasis or implantation, as the diseased area frequently resembles an excoriation, such as could have occurred in the preparation for operation. Extension into the bladder may be unrecognized, except by means of a cystoscopic examination. In performing abdominal hysterectomy for carcinoma of the cervix I first curette the cancer area, and cauterize with pure carbolic acid, and then recleanse the vagina thoroughly. It may be necessary in some cases where oozing persists to tightly sew the cervix, if the cautery fails to check such bleeding. I do not make a median incision in the abdomen, but prefer to incise through either rectus muscle close to the median line, thus avoiding hernia, one of the so-called disadvantages of the abdominal route.

In performing hysterectomy I employ the usual technique and methods of others, with possibly a few variations. After removing the uterus the bleeding edges of the vagina are whipped over by a lock suture. Gauze drainage is introduced into the vagina from above downward and allowed to project slightly into the pelvis when the peritoneal flap from the anterior surface of the uterus, which carries the bladder with it, is brought over the projecting gauze and stitched to the posterior wall of the vagina; in this wise completing the operation as an extraperitoneal one. The abdominal wound is closed by tier suture.

The cautery knife of Downs is used and extolled by a few operators, first, because it renders the operation bloodless, and secondly, that its ultimate results are presumably better in carcinoma cases. I have always been satisfied, however, with my results by the use of suture and ligature and those cases calling for the

cautery to destroy tissue are not ones adapted to radical operation. I might add that a multiplicity of instruments, awkward to handle and which tend to make a complicated out of a simple operation, is to be deprecated. The more ideal results obtained in delicate operative procedures often depend upon a simplicity of technique, few instruments and the skilful use of the gloved fingers. Cancer of the fundus of the uterus is usually an adenocarcinoma and in the early stages the diagnosis depends in a great measure upon the microscope.

The prognosis in these cases is much more favorable than in those of the cervix, perhaps seventy-five per cent. of operations performed early resulting in cure with freedom from recurrence. Such results are due to the slowness with which lymphatic metastasis occurs and to the position of the growth, far removed from the vagina, bladder and rectum. Lubarsch offers the explanation that in cancer of the uterus the epithelial cells are quite large and cannot easily enter the lymph radicles. Cancer of the body of the uterus requires complete hysterectomy and in the early stages may be removed through the vagina.

ANESTHESIA IN ABDOMINAL SURGERY.

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PHILADELPHIA.

In presenting this paper, I do so with the hope that we will have a very free and open discussion of this important subject—anesthesia in abdominal surgery. That time has passed when one can say with any degree of conscience, "O, any one can administer the anesthetic." I am willing to admit that almost any one can pour ether or chloroform on a towel and rob a patient of his senses and produce narcosis. So can almost any one cut off a leg. We must remember, however, that there is something besides mortality and accidents in giving anesthesia; there is the patient's mental suffering previous to the surgeon's work. The many doubts, misgivings and the fears of our patient are often caused more by the thought of the anesthetic than of the operation. Let each one put himself in the patient's place, and I doubt not that he would understand and appreciate the cause of rapid pulse, quick breathing and anxious face. These and mental anguish are manifest on the approach of the stranger who is to destroy thought, feeling and strength by giving them something of which they know little or nothing. It is easy for us, who have seen so many cases, to make light of this mental terror, and yet does the telling a woman in labor how thousands have suffered as she is suffering make *her* pain the less? When we stop to consider this subject from the patient's standpoint, the question as to who shall be selected to administer the anesthetic becomes one of great importance. Some of us have seen patients nearly drowned by ether and killed by chloroform in the hands of those who knew nothing about one or the other. Again, we have seen ether poured into a metal cone by the ounce at a dose until it was dripping over the patient's neck, or a piece of gauze is soaked and placed tightly over the face, eyes and all, followed by the request "to breathe easily." With enough help, the case is etherized, but there is little easy breathing. We are all quite familiar

with the clinic days in some of our large hospitals, where the one selected to administer the anesthesia is the latest addition to the Resident Staff. The surgeon who is in a hurry to get through with his six or eight cases compels the young man to half strangle all his patients and give to each four or five times more vapor than is necessary. When I entered the hospital as an interne, among my first duties was the administration of anesthetics—this in spite of the fact that I had never done so previous to my appointment. My experience was limited to seeing ether used in such quantities that I am satisfied twenty to thirty ounces were consumed during a simple section; it was poured onto gauze or more often into a cone by the ounce at a time. We are beginning to see that this condition of affairs is faulty, and one which demands our attention and some radical changes. I am glad to know that our Colleges are now teaching this branch to their students, and that in some hospitals a salaried anesthetist forms one of the Staff. Every hospital should have such a man and much will be accomplished when this branch is recognized as a speciality. I am in a position to know that the student of to-day has little knowledge regarding the administration of anesthesia, as in my obstetrical work I am frequently called upon to apply forceps, repair a laceration, and occasionally to perform version and find the coming physician tremendously deficient. Take away the anesthesia from the newest interne, the nurse, the orderly and the layman, and place it in the hands of a well-trained, experienced man, and we will have made a great stride on a good road. I dare say, should any of us be compelled to take an anesthetic that each would make a pretty keen choice as to who should administer it. How many of you know the amount consumed or the condition of your patient while you are washing your hands? Consider just a moment, and I doubt not but you will agree with me that the anesthetist ought to be as well trained in his work as the surgeon is in his. He should act promptly and properly on the first indication of failing heart or respiration; he should watch the pulse and not the pelvic cavity, the pupils and not the peritoneum. I insist on these things for the reason that a patient under surgical anesthesia is in a condition to be closely watched. Most of the accidents can be accounted for by the anesthetist not seeing *at once* the first indication of distress. Those who have had considerable experience in this subject acquire a certain skill in appreciating quickly the approach of complications, a skill which cannot be explained any more than can the sense

of touch, attained by some operators, and yet appears to be quite as keen and in some cases quite as important. How often does the success of an operation depend on a carefully given anesthetic and how often does the surgeon's welfare depend on the anesthetist are two questions not given enough consideration. Arriving at the time when we select our anesthetizer with the same care as the patients their surgeon, we will find the choice of the anesthetic one of less importance than formerly. I mean that the choice of any certain substance is of far less importance than the one selected to administer it. This selection is one largely of the individual operator and of locality. In the East ether is more popular; in the South chloroform is used with great success and we find the choice is one of teaching and experience. The man coming from the South, after becoming familiar with chloroform, will see operations under ether and being favorably impressed will substitute and find it unsatisfactory; while those whose work has been limited to ether will have accidents when using chloroform. The physician who practises in the country is told and shown the benefits of various combinations, and then goes home to waste valuable time in the endeavor to procure the oxygen tubes or nitrous oxide bags. For the reason that my experience has been largely one of administering ether is not sufficient for my saying that this is the best and only substance which should be selected in abdominal surgery.

Spinal cocainization has been tried and it seems found wanting. A number of sucessful operations within the abdominal cavity have been done, yet one such experience as Dr. Edward Wallace Lee had in a section would make most of us abandon this form of anesthesia. Dr. Lee tells us[1]: "In the surgical cases there was one abdominal section for tuboovarian abscess. The incision was quite long, and was made without the least distress to the patient; but when I inserted my fingers into the abdominal cavity, she became restless and highly hysterical. A loop of intestine presented itself in the wound, which, unfortunately, the patient saw. She became maniacal, and it was with difficulty that I was able to extract my hand from the abdominal cavity, such were the powerful contractions of the abdominal muscles. It is needless to say that the operation was finished under chloroform narcosis. The patient told me subsequently that it was not so much the pain, but a nervousness she could not control."

[1]New York Medical Journal and Philadelphia Medical Journal, August 29, 1903. Page 408.

Anesthol is highly spoken of and successfully used by Dr. Willy Meyer, yet the advantages alluded to, can, I believe, be obtained by the *proper* use of ether. Theoretically, I should think the preliminary morphine injection would be harmful in many abdominal lesions, practically the author says not. I do not wish to dismiss anesthol as of little importance, it is only the lack of experience with this substance which compels so few words as to its virtues.

My use of chloroform is limited to some fifty cases, all of which were successful so far as the anesthetic was concerned. I am not among those who have any fear of this vapor in abdominal surgery, and feel that in careful hands it becomes a much safer substance than many believe.

When we come to the selection of our anesthetic, it will in the vast majority of cases, be one between ether, pure, with nitrous oxide, with oxygen or chloroform; by most of us probably ether alone will be chosen. The latter is the one I shall now call your attention to and give my reasons for preferring this anesthetic.

1. It is always or nearly always possible to procure a fresh supply. This is not so with chloroform as that made for anesthesia is not kept by all druggists, a prescription for this drug being filled by the commercial article which, of course, is totally unfit for anesthesia. Only a day or two ago I heard of a patient who was operated upon after being put under the influence of spirits of chloroform.

2. So far as statistics go ether is the safer, about one death occurring in ten thousand cases; chloroform one in two thousand. The educated public know this and frequently request that chloroform shall not be used. Personally, I do not think that this gives the relative safety in competent hands.

3. The patient can be placed under ether nearly and in a good number of cases, quite as easily, quickly and quietly as with chloroform. In point of fact, I have etherized a patient in exactly ten seconds, he taking only five inspirations. This was a strong, robust young man who was to be operated upon for hernia. The anesthetic was administered by fitting over the nose and mouth a rubber mask connected to the ether bottle by a tube, the bottle being plunged into boiling water a few seconds previous to beginning the administration. Leaving out the element of speed, this method has nothing to recommend it.

4. With ether you can keep the patient in pretty much the stage

desired; with chloroform I have seen them go quickly from sensation of pain to deep narcosis.

5. When we are compelled to place the anesthesia in the hands of a layman or, as has been done, the domestic servant, I believe ether is safer than chloroform. The latter is likely to kill early, during the first few inspirations or when struggling occurs—just the time when one not familiar with the vapor would crowd the anesthetic. This point, no doubt, will be disputed.

6. When organic heart disease is present ether, for a time, stimulates the heart. I have repeatedly seen patients leave the table in a better cardiac condition than before the operation.

7. I have administered ether to alcoholics, those with pulmonary tuberculosis and with pathological kidneys, and believe it is as safe as any general anesthetic, if not safer.

More important than the reasons for selecting ether in abdominal surgery are the results obtained by its use. In a series of about one thousand anesthesias, in my own and one other physician's practice who employs the method to be alluded to, we have had no deaths from the anesthetic. Nothing but pure ether was used, excepting in one case where oxygen was given by request of the patient. The head has never been lower than the trunk in a single case. No instrument of any kind was ever placed on the patient's tongue, neither has a mouth-gag been used. Hypodermic stimulation was necessary in only three cases, atropine and strychnine being given. Artificial respiration was practised twice. In both the cause of respiratory failure was the same, and I was much impressed by the accident. Each occurred in a patient undergoing hysterectomy for fibroid tumor. In the first I had placed a large gauze towel in the abdomen to hold up the viscera and at once the patient ceased breathing; the ether was withdrawn, jaw pushed forward, and artificial respiration started without the slightest response. I then withdrew the towel with the result of having respiration return at once. In the second case I was giving the ether, when the gauze was placed in the abdomen, precisely the same occurrence taking place as in the first case. After removing the pad breathing was established; it was again introduced within the abdomen and breathing at once ceased. The Trendelenburg position was not used in any case. The question as to what effect, in regard to the anesthetic, this posture may have, I am not prepared to say.

In this series almost every abdominal condition has been encountered, including many cases considered bad subjects for

etherization; profound shock from ruptured ectopic pregnancy; bowel obstruction; post puerperal sepsis; ruptured gangrenous appendicitis, and general peritonitis. Kidney operations, those on the liver and gall-bladder, acute and chronic suppurative tubal and ovarian disease may also be mentioned. It is only proper, however, that I should call your attention to the fact that at least ninety per cent. of these patients were women. This point should be understood as the cases do not include the lower, hard drinking element, so commonly seen in general hospital work. Some of these do badly under ether, and we have to substitute chloroform. Personally, I have seen only one case where ether was unsatisfactory.

The question naturally arises, could not the same results have been obtained by the use of some anesthetic other than ether? I doubt not that chloroform could have been given, and yet some of these operations lasted one-and-a-half to two hours. Excepting in the hands of an expert, the administration for this time, in one exhausted by chronic suppuration, would, I feel, have had a less chance for a successful outcome. I should like to have some discussion on this point by those who use it in such cases. There is nothing new or out of the ordinary in regard to the method of administration in the series of cases alluded to. There are, however, some important details which seem small, yet are required as practical experience has demonstrated. Those about to undergo a surgical operation are acutely alive to their surroundings and, as I have said, in many cases fearful of the anesthetic. I would urge upon those about to administer these, the need for remembering, that there is something besides having our patient react from the operation. There is the anxious mental state, the fear that they will die, the fear of feeling the surgeon's knife, the fear that they will not be closely watched. Some may say these things are trivial; the operation is the important part. I answer, they are *not* trivial, and that your work will be better done; your patient's convalescence shorter, and your success greater by paying attention to details usually ignored. How many men say a few encouraging words to their patient, and then send a man they dread more than him, who thinks his "vocation" is to cause unconsciousness regardless of ways and means. The anesthetist should be one who approaches his patient in a manner to instil confidence; he must be neatly dressed; have clean hands and nails; he should never wear an operating gown or cap, nor have his sleeves rolled up. He should

never have hemostats, mouth-gag or tongue-puller hanging to his coat; they are usually unnecessary and disconcerting to the patient. Any one present should be requested to be as near absolutely quiet as possible; talking or any noise interferes with a satisfactory anesthesia. Here I would suggest that the family physician, friend or member of the family, who loudly announces the condition of the patient's pulse, or criticizes your method, be invited to leave the room. This has happened several times to the writer, much to the patient's distress. A few encouraging words, the assurance that the operation will not be started until they are fully under the anesthetic and the statement as to the good quality of the pulse are all important in many cases, especially with women. The patient should now be requested to clear the air passages and to remove any foreign body from the mouth.

The ether, always from a freshly opened can; sulphuric and not a sulphurous ether, is administered on a square of gauze of at least twenty layers. We should begin by allowing a few drops to fall on the center of the pad and let the patient "see what it is like" by holding several inches from the face. This is followed by a request to close the eyes and to breathe as they wish, but stating the benefits of slow, deep inspirations; still holding the gauze, so as not to touch the face, ten to twenty drops are added, being careful not to allow one to fall in the patient's eye. In the majority of cases we are able to increase the amount every few seconds until thirty or forty drops are added each time, the pad being brought close to the nose and mouth, never covering the eyes, and allowed to stay there throughout the entire operation. In some cases after breathing quietly eight or ten times, the respiration will cease, in this case the patient wants air and the withdrawal of your towel will be followed by two or three quick inspirations. Early in the administration of ether the ceasing of respiration need rarely cause any anxiety, unless it is caused by spasm of the respiratory muscles. In this case immediate steps should be taken for its reestablishment. When your patient has been fully etherized, there are two methods which may be used during the operation: *1.* The anesthetic may be given by dropping one-half to one dram over the nose-tip every minute or so; *2.* Use the "drop method" as in giving chloroform, allowing one drop to slowly follow another. One very important point in this connection, is *to always turn your towel over* after each addition in the former method and every few minutes in using the "drop method." During an ordinary section I always

use two towels, one soon becomes saturated with mucus which interferes with the proper volatilization of ether. Whenever possible, I prefer to keep the gauze an inch from the face, allowing a certain admixture with air; this can frequently be done in acute septic cases and those whose resisting powers are feeble. The special relation of anesthesia to abdominal surgery requires the attention, on some few points of importance, to operator and anesthetist alike. The surgeon on his part must not hurry his assistant so as to strangle his patient, neither should he have patients placed under anesthesia until he is prepared to make his incision. This embraces two procedures: First, if there is only one patient for operation, operate just as soon as the sufferer is placed on the table. There is nothing worse than chronic surgery within the abdominal cavity and all lectures, histories and notes should be read before the case is brought in the operating room. Operate with the same speed and dexterity as in pre-anesthetic days; do your work as deftly and quickly as is compatible with good surgery. The other class is where there are several cases for one clinic; never allow a patient to be anesthetized until you are ready to make your incision within five minutes. Aside from the injustice to your patient, think of their vapor-logged condition. Avoid instructing your assistant as to the serious condition of lungs and heart and then add "hurry your anesthetic, my time is limited"; I have known one of the best anesthetists to be robbed of all confidence by this advice;—following instructions was the cause of a death.

Unless absolutely necessary, never request an anesthetic to be given to anyone suffering from an "acute cold"; your patient will go under struggling, stay under badly, and come out worse. The anesthetist on his part should keep in mind, that a septic patient usually requires very little vapor to produce and keep under surgical narcosis; this is especially true of puerperal sepsis. That pus cases of all kinds, in many instances, stand anesthesia well; this is equally so of abdominal hysterectomies. The removal of a cystoma, even one the size of a lemon, is frequently followed by shock out of all proportion to the operation. That during perineal operations and vaginal hysterectomies, very often the patient appears shocked during the operation, yet when the legs are straightened improvement rapidly occurs. It would appear that the flexing and holding of the thighs over the abdomen is conducive to shock. He must remember during appendicitis and bowel stitching operations, that vomiting and retching are

to be strictly avoided; a few inspirations of air followed by several drops of fresh vapor will usually overcome this tendency. That heaving of the abdominal wall and efforts to swallow, seen early in the administration, indicate the attempt to vomit; in this case push your anesthetic; when occurring late in the operation, the patient needs air, withdraw the vapor, gently push the jaw forward, and turn the head to one side. I know of one case where the patient, vomiting during anesthesia filled the trachea with gastric contents which were found post-mortem. It is always proper to inform the operator of failing pulse or respiration, keeping in mind, that separating strong adhesions, enucleating old pus-tubes, hemorrhage, and when the peritoneum is opened in vaginal hysterectomy that there usually is a change in character of both breathing and pulse rate. Always withdraw the anesthetic when tapping a large cyst or ascites, and when removing bulky fibroids, *keep it withdrawn until the patient shows signs of returning consciousness.* The anesthetist's whole endeavor should be to administer the vapor so gradually and carefully that the transition from one stage to the next will be a slow agreeable process, void of all sensation of suffocation. Struggling is the result of haste and of all the things to be avoided most rigidly it is this, as I believe it is the forerunner of about all accidents during chloroform or ether narcosis. It can about always be avoided by giving the vapor slowly; mixed with a good quantity of air.

I have made inquiries regarding the amount of ether consumed during a section, lasting from thirty to forty minutes and find from six to eighteen ounces are used, the time to induce surgical narcosis about ten minutes. Bear in mind these two points, the average time should be eight minutes, the amount four to five ounces. In the series of cases spoken of it has never been necessary to administer more than eight ounces, although some of the procedures lasted one and a half to two hours. It is interesting to know that some surgeons are offering prizes to the student who uses the least anesthetic during their clinic. When we hear of prominent operators using ether with oxygen or nitrous oxide, the same men who for many years have administered pure ether, are we not apt to consider that there must be a reason for this change? That it shows advancement along the natural lines of progress and that it is more up to date is equally true, and yet I cannot help but feel that it is largely due to an abuse of what has been given us by Morton and Simpson; a neglect of the possibilities of ether or chloroform alone. Paying more attention

to those we already possess would have made men hesitate to try the combinations. I do not mean to say that the future will not produce an anesthetic more safe, more pleasant, or more satisfactory than ether or chloroform, but I am about convinced should we first perfect our administration, our care and our attention to these that future discoveries along this line will not be tried before the discoverer himself knows what he has given us.

In closing this paper I fully realize its shortcomings and know that many important things have been left unsaid. It is given you with the wish that these omissions will be filled by the opinions of those present who have had a long and varied experience along this line of work, opinions which are so important to the general practitioner who reads our papers and discussions.

THE SURGICAL TREATMENT OF GALLSTONES: WITH A REPORT OF SIX CASES.

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It is practically within the last decade that the surgeon has become particularly interested in the treatment of gallstones, but happily within that time he has proven master of the situation. Like appendicitis, gallstone disease is a much more frequent and important malady than has been generally supposed. The intricate and delicate construction of the liver and gall-bladder with their various ducts and bloodvessels requires the perfect working of their functions or a serious disturbance of the whole system is apt to follow. That cholelithiasis is of frequent occurrence can be easily proven by following up a large number of autopsies.

While a student under Prof. Virchow nearly twenty years ago, I was impressed with the great frequency of gallstones, and their apparent relation to cancer of the liver and gall-bladder. At present most surgeons contend that in a very large proportion of cases of primary cancer of the liver or gall-bladder, gallstones are found either in the gall-bladder or obstructing its ducts; usually the multiple variety in the gall-bladder.

In Ashurst's exhaustive Encyclopedia published in 1884, Dr. Henry Morris says: "Cholecystotomy, like some other abdominal operations, has long been thought of, rarely performed and strongly condemned."

In 1878, Dr. Marion Sims had planned and performed the first recorded cholecystotomy, but his patient died in eight days.

After him came Lawson Tait, closely followed by about a dozen others. A story related by a celebrated Boston surgeon illustrates the feeling the surgeon had toward this operation fifteen years ago. He relates that an old professional friend from the rural part of New Hampshire came to Boston to consult him, about himself, insisting that he had a gallstone impacted in the common bile duct, and that if it was not removed he should die in one of

the severe attacks of biliary colic to which he was subject. However, the operation was not performed, and the doctor soon after died. The autopsy showed a large stone in the common duct exactly as the patient had described it.

Within the last few years, however, so much has been accomplished that the most difficult cases of gallstone have become comparatively easy of diagnosis and operation.

The following indications may be considered as justifying an operation:

1. Frequently recurring biliary colic with or without jaundice, and with or without enlargement of the gall-bladder.

2. Enlargement of the gall-bladder without jaundice, even when not accompanied with great pain.

3. In persistent jaundice ushered in with pain with or without recent paroxysms of pain, where it is probable that there is obstruction of the common duct by a stone.

4. In empyema of gall-bladder.

5. In peritonitis starting in the right hypochondriac region.

6. In abscesses around the gall-bladder or its ducts.

7. In cases where persistent pain may be caused by adhesions from stones that have already passed.

8. In all cases of suspected obstruction of the gall ducts.

9. In all cases of chronic or phlegmonous cholecystitis.

The operation consists in either a vertical incision in the right hypochondriac region over the gall-bladder, or a transverse or elliptical incision extending from the median line near the umbilicus to the cartilage of the ninth rib on a line with the lower border of the ribs, to allow the operator to explore the region of the gall-bladder and its ducts. Stones can be quite easily felt in the common duct, but sometimes if they are in the gall-bladder or cystic ducts, it is necessary to open the gall-bladder before they can be positively demonstrated. The gall-bladder in these cases is usually found distended, and the wall may be either very thin and easily lacerated, or it may be very much thickened. The latter has been the case where it is simply distended in old cases of occlusion of the ducts.

If possible, the gall-bladder is grasped by a tenaculum forceps and drawn well up through the incision. The fluid contents are aspirated and an incision made in the gall-bladder large enough to introduce a finger when it can be easily explored and the stones, if any, removed either by pressing them out by the fingers, or with a ring forceps. It is frequently found that one or more stones

are impacted in the cystic duct, and these are often very difficult and sometimes impossible to remove without incising the duct itself. If they can all be extracted and there is a certainty that the ducts are free for the future passage of the bile into the intestine, the opening into the gall-bladder may be carefully closed (I use chromicised catgut), and the organ returned into the abdominal cavity, and the ideal cholecystotomy has been done. It is, however, better to use careful drainage in every case, leaving the abdominal incision to be closed later. When there is doubt as to the proper discharge of bile through the bile ducts, the opening in the gall-bladder must be brought into the abdominal incision and stitched fast, care being taken to include the peritoneum and deep abdominal aponeurosis as well as the skin.

The operator can then wait, and if there is obstruction of the cystic or common ducts there will form a permanent biliary fistula.

Then, by a second operation a cholecystenterostomy must be done. This can be achieved by bringing a loop of the colon and the gall-bladder together, making an incision 1½ inches long in each and suturing them together by a double row of sutures. The first row coapting the edges of the two openings, and the second row of Lembert sutures bringing the serous surfaces together outside the first. This is a rather delicate and difficult procedure, but a possible and satisfactory one. At the present day another method is much oftener followed, and the gall-bladder and intestine are united by the use of a Murphy button. One ring is carefully stitched into the wall of the gall-bladder, and the other in the incision in the intestine. The button passes the intestine in from 12 to 20 days. In anastomosis without the use of the button, an accident that has befallen me once is closure of the opening by cicatricial contraction, either because my opening was too small or from the fact that the bile drained too easily from the external fistula. This is worth guarding against, because a second operation is annoying, and also very much more difficult, owing to surrounding adhesions. The button, however, cannot be used in all cases owing to the softened walls of the gall-bladder, to a small contracted gall-bladder or to adhesions. In such cases the only alternative left to the surgeon is excision of the gall-bladder and ligature of the duct and cystic artery. In these procedures, and especially where there has been an old cholecystitis, great care should be exercised to avoid the escape of the contents of the gall-bladder into the peritoneal cavity, for it has been conclusively proven that cholelithiasis is of infectious origin due to either the

invasion of the colon bacillus, or that of typhoid or even streptococci. In cases where the bile-ducts are pervious, the incision may be safely sutured, but it is much safer to drain it for a time by properly stitching into the abdominal wall. The fistula will close of itself without any further operation.

In many cases of severe recurrent colic, with or without jaundice, the diagnosis is quite easily made of obstruction of the common bile-duct by one or more stones. In such cases it is necessary to do choledochotomy.

As I have said, such a stone can usually be felt and grasped between the exploring fingers, but is not always easily removed, owing to the almost inaccessible position of the common duct in some cases. The transverse incision is always preferable in choledochotomy and the duct when exposed is freely incised and the stone removed, after which the duct is sutured, when possible. I have seen the duct so deeply buried among firm adhesions and exudations from previous inflammations, that it was only reached and incised after going through several inches of this exudative tissue, and where suturing the duct itself was absolutely impossible. In my case the duct was left open and no trouble was experienced as the surrounding wall of adhesions seemed to completely close the opening which I had made in the duct. In 1898 Dr. Halstead invented a set of little hammers with graduated heads which he used in suturing such cases, but I doubt if they could have been used successfully in my case, owing to the firmness of the adhesions. If the calculus is quite near the duodenal end of the common duct, it is perhaps better to make an incision into the duodenum, and then either incise or dilate the orifice of the duct and remove the stone through the intestine. When a gallstone is impacted into the cystic duct that cannot be pressed back into the gall-bladder, the duct may be incised as in the case of the common duct, and it is usually much more easily reached and entered than the common duct. Nearly all surgeons agree as to the necessity and methods of the operation, and vary very little in technic except as to the closure or drainage of the abdomen.

Healthy bile is not septic, and in small quantities is harmless in the abdominal cavity, but the contents of the gall-bladder in cholelithiasis is rarely, if ever, composed of normal bile. It may be pus, dirty serum, or bile in all stages of degeneration. Therefore, it is safest in all cases where we do not feel absolutely sure of our sutures, or where the ducts are too inaccessible, where the gall-bladder is much shrunken, or its walls so friable that sutures can-

not be trusted to hold, to carefully drain. I use a rubber drainage tube carefully packed around by several layers of sterile gauze to protect the peritoneal cavity until the necessary repair has taken place. After about two days the gauze is removed, and if there is no oozing, the drain is also removed. Whenever there is no obstruction of the ducts, an opening into the gall-bladder will close of itself.

In cases where the incision in the duct in a choledochotomy cannot be closed, owing to the duct being deep in the abdomen or bound down by adhesions or there is a very thick abdominal wall, the same method of drainage may be used or an outlet may be made posteriorly through the posterior hepatic fossa, a pouch behind the right lobe of the liver separated from the peritoneal cavity.

Several of the following cases which I shall endeavor to truthfully report were done early in the '90s, and the technic of the operation was not as plainly laid down for us as it is at the present time.

CASE I.—Woman, 40 years old, had suffered from severe pain in abdomen for many years, and at times could feel a distinct tumor in the right hypochondrium; incision was made over site of the tumor, and a gallstone the size of a hazel nut easily felt within the common duct. The duct was incised and the stone easily moved. Incision was sutured with fine catgut; the abdominal wound closed. The recovery was rapid and uneventful. This was the simplest and easiest case I have ever had the luck to find.

CASE II.—Woman, 42 years old, had been my own patient for ten years, and had suffered for nearly fifteen years with attacks of biliary colic and jaundice. The attacks had become more and more frequent, and were apparently occasioned by the slightest indiscretion of diet. Diagnosis was gallstone sacculated in common bile duct, and stone found in the duct deep down in abdomen, and held down by strong adhesions. The mass consisted of omentum, head of pancreas and seemingly much tissue that did not belong there at all, the product of inflammation and exudation. By passing the left hand under the mass and pressing it up into the wound and by using fingers and blunt instruments I finally reached the duct, but could not separate it from the mass of surrounding tissue. I ventured to cut down upon the stone, and finally made an opening large enough to squeeze it out. It was absolutely impossible to suture the duct, and I let it drop back trusting to the

pressure of the surrounding masses of adhesions to close the incision. The wound was closed, a proceeding I would hardly advocate now. The patient made a rapid and complete recovery, and has since gained fifty pounds.

CASE III.—Woman, 37 years old, had suffered very severe pain for years. There was also at times a large tumor above the gall-bladder. A large stone was found in the common duct which was with difficulty incised and the stone removed. The duct was sutured as well as possible and wound closed as in the last case. but with not such a good result. After twenty-four hours the patient developed a troublesome cough and, to my surprise, coughed up large quantities of bile-tinged expectoration. She soon developed jaundice, and finally died in an extreme condition of cohlemia. This might probably have been averted had proper drainage been employed.

CASE IV.—Woman, 38 years old, suffered for many years with attacks of colic; diagnosis of gallstone made; no tumor could be felt owing to the fatness of patient. Incision was made over point of frequent pain, and a distended gall-bladder found, which was aspirated, drawn up into the wound, and incised. It contained about four ounces of a dark muddy-looking fluid, and 116 gallstones varying in size from a grain of sand to an almond. The gall-bladder was then stitched into the wound and a drainage tube introduced. The wound was drained for three days, when the tube was removed, as nothing but clear bile was discharging. A compress was placed over the wound, which closed entirely in about three weeks.

CASE V.—A young lady of 30 years had suffered very much for about two years. Had constant distress in the neighborhood of the gall-bladder and ducts. Had become very much emaciated, and the stomach for long periods rejected all food. Diagnosis of gallstone was made; an incision was made over gall-bladder and extended along lower border of the ribs to explore common duct. Gall-bladder found very little distended, contained only partly normal bile and no gallstones. Examination of the cystic and common ducts disclosed nothing. I was about to close the wound when I felt a small stone almost projecting into the duodenum. I grasped the duct and stone between thumb and finger and after several attempts succeeded in forcing it into the intestine. The wound was closed. The patient did well, rapidly gaining flesh and strength and has been quite well ever since.

CASE VI.—Woman, 43 years old. Had a large tumor in the

right hypochondrium; had never had jaundice or colic. Incision made over site of tumor; found gall-bladder very much enlarged and the wall thickened. Gall-bladder was aspirated, and 9 ounces of clear fluid withdrawn. The wall of the gall-bladder was found to be nearly half an inch thick. The incision was made large enough to explore, when two large stones were found occluding the cystic duct, one of which came away with comparative ease, but the second was started from its resting place with very great difficulty. Owing to the bad condition of the patient, the thickened gall-bladder was stitched into the wound and drained. It was soon apparent that there was obstruction, and that the biliary fistula would be permanent. This patient then absolutely refused any further operation and left my charge in April, 1900. After enduring the fistula for about eight months, she returned to me in December willing to submit to another operation. My idea was to do a cholecystenterostomy by the use of the Murphy button. This I found impossible, as during the previous eight months the gall-bladder had become little more than a fibrous sinus. I then opened this canal and bringing a loop of colon into the wound united the two by a double row of sutures. The wound was left open and packed with gauze. The fistulous opening continued for some time, but finally with the aid of compresses closed of itself. The patient has since then enjoyed excellent health.

INTRA-ABDOMINAL TORSION OF THE OMENTUM.

By THOMAS B. NOBLE, M.D.,
INDIANAPOLIS.

Quoting from Douglas's Surgical Diseases of the Abdomen, "Dr. Jos. Wiener in a contribution to the *Annals of Surgery*, vol. XXXII, 1900, gives us practically all that is known concerning this very rare condition." By a very exhaustive research, Wiener has been able to collect but seven cases, one of which is his own. G. G. Eitel, of Minneapolis, reports in the *New York Med. Record* of May 20, 1899, a case in his own practice which, with Wiener's collection, makes eight cases so far reported. Of these eight cases, five are so intimately associated with hernia as to make of them pecular complications of that disease, rather than cases of omental torsion *per se*. The other three cases are so far removed from any other tangible pathological process as to attain to the dignity of a classification of their own, and should be properly denominated intra-abdominal torsions of the omentum.

Under this classification, I wish to report the following:

Miss D., an otherwise healthy, robust stenographer, 24 years of age, sent for me on September 15, 1902. The night before, she had suffered from excruciating pains in the stomach, which were attended by nausea and vomiting. She had had these attacks before at irregular intervals during the last two years, but they had not been so severe as to necessitate the presence of a physician. Her family history was negative. Excepting a gonorrheal infection two and one-half years previous, and the interval attacks of pain in the stomach, she had always been healthy and well; and her general appearance, as I first saw her on the morning of September 15th, was that of one who had always enjoyed good health. I found her with a temperature of 100° F.. pulse 90, tongue slightly coated, bowels having moved the day before. Nausea and vomiting had ceased. She lay upon her back with thighs flexed holding hot moist towels to the abdomen. Palpa-

tion revealed general abdominal tenderness, with accentuation of rigidity on the right side. Pressure upon McBurney's point elicited great pain in this region and simultaneously in the stomach. "That hurts my stomach and makes me sick," she said. There was slight gaseous distention of the abdomen, but the tympanitic note became distinctly dull in an ill-defined area to the right and below the umbilicus. But owing to the presence of considerable subcutaneous fat and muscular rigidity, nothing definite could be palpated.

A diagnosis of appendicitis was made and operation advised. She refused to undergo an operation, however, and the case was treated by local application of ice and restricted diet. Under these measures the symptoms gradually subsided until the evening of September 21st, six days after the initial symptoms, when she suddenly had a chill, followed by a temperature of 101°. Pain increased, and now a mass could be distinctly felt about midway between right anterior superior spine and umbilicus. Her skin became leaky, and it was very evident that septic absorption was in progress. By this time, the patient appreciated the gravity of her condition and consented to operation.

The abdomen was opened next morning by an incision directly down upon the mass above described. Between the transversalis fascia and the peritoneum quite a little serous exudate was found. On opening the peritoneum, a dark, almost black, mass came immediately into view. It was two inches wide and five inches long. It was everywhere surrounded by recent adhesions,—coils of intestine and omental tissue forming the dense barrier in which the mass was embedded. The walls of the intestinal loops were greatly thickened wherever they helped to form the capsule. Hemorrhage was profuse during the process of dissection. The mass proved to be a process of omentum which had become attached to the fimbria of the right tube. With the gastrocolic origin as the proximal point and the adhesion to the fimbria as the distal, an axis was formed about which the omentum had become rolled upon itself to such a dagree as to completely shut off its blood supply. Coagulation necrosis was complete, and I doubt not that if it had been allowed to remain, infection with abscess formation would have been the result. The appendix was removed, though it took no part in the production of the symptoms at hand. The patient left the hospital in two weeks and has been in perfect health since.

The pathological sequence in this case is of interest. I take it that during her gonorrheal infection some septic material

escaped through the fimbria from a mild salpingitis. A process of omentum immediately came down to take care of this intrusion, became adherent about the fimbria, and thus a continuous band of omental tissue was established between the colon and tube. About this band or axis that portion of omental substance lying on either side was made to roll or *flow* by, probably, the vermicular action of the intestine, together with the unequal degree of regional pressure within the abdomen brought about by transit of gases through the intestinal loops. I have used the word *flow* because the omentum, like a semi-fluid body, passes over, under, through or among the abdominal contents always in the direction of least resistance. Now, let us suppose that we have an axis of rotation formed as in the above case, and that the passage of gases through the intestine from one to the other side of this axis makes unequal pressure on the two sides, and that the omentum will flow or fall to the side of lesser resistance, is it not possible that in this way a torsion might occur? It is only on this hypothesis that I can account for the character of my case. And if such an hypothesis be correct, might not these cases happen with greater frequency than these reports indicate? Torsion might occur with absorption of the mass and nothing remain but bands of adhesions; or, abscess might form and conditions at the time of evacuation be such as to make a proper interpretation impossible.

Intra-abdominal torsion of the omentum is necessarily a complicating or secondary condition to some other pathology. Its diagnosis must be difficult. It may complicate or simulate such diseases as tubercular peritonitis, appendicitis, intestinal obstruction, abdominal new growths and cyst formations, and from the cases so far reported is secondary to hernia more often than to any other one disease.

REPORT OF THREE CASES OF ESTHIOMENE.

By EMIL E. GUENTHER, M.D.,
NEWARK.

Case I.—This case came under the care of Dr. E. J. Ill about eighteen years ago. I am unable to find the history in our case-book at the hospital, but as I took this case to Dr. Charles H. Kelsey, of New York, at the request of Dr. Ill, and he has reported the same in his "Surgery of the Rectum and Pelvis," I will quote him. I have by the kindness of Dr. E. J. Ill, of Newark, N. J., seen a very unusual case of this disease (esthiomène) inasmuch as the patient was only fourteen years old, and had been suffering since the age of nine. The usual manifestations were perfectly characteristic; the labia were enormously hypertrophied, and destruction of the rectum was so great as to lead me to advise a colostomy. In this case there was a good history of congenital syphilis, and to my surprise the patient was greatly relieved by antisyphilitic treatment. (Kelsey.)

Dr. Ill informs me that this is a mistake, and the patient was not benefited by antisyphilitic treatment, but her condition was unchanged when he last saw her, several years since.

Case II.—Mary V. D., aged thirty years, married, has had four children and four abortions. Cause of abortions unknown. Last pregnancy eight years ago. Abortion at fourth month. First menstruation, fourteen years, normal. Family history good. Present illness three years. Admitted to Dr. Ill's ward service at St. Barnabas Hospital, of Newark, N. J., during September, 1887. Physical examination September 16, 1887.

Vulva and both sides of the thighs excoriated, also the skin above the pubes and the lower part of the abdomen and up to the sacrum posteriorly. Labia very much swollen. Right labium majus larger than the left; from the right labium minum arises a tumor two and a half inches across and five and a half inches

around. It is lobular and edematous. Several smaller growths of the same description are attached along the orifice of the vagina. The perineum is deeply lacerated, and covered with scars. There is an opening from the vagina, just above the sphincter into the rectum, through which a finger can be passed. The rectum is small and full of cicatrices for about two inches in depth. The urethra is split up to the neck of the bladder, and the finger can be passed into the bladder. The disease was

Case II.

thought to be specific in nature, and she was given antisyphilitic treatment. October 7, 1887, the tumors were removed and the resulting wounds closed with catgut.

October 21st; has slightly better control over her bladder. Patient discharged somewhat improved. She was advised to continue specific treatment and to report at our clinic for observation.

On September 9th, 1891, she was again admitted to the hospital. The most annoying symptom is incontinence of urine, as the result of which there is considerable excoriation about the thighs

and buttocks. At no time has there been pain (except that produced by the excoriations) and, although she has now been ill with this disease for seven years, her general condition is still good and she is well nourished. She has not improved since her discharge.

CASE III.—Christina H., thirty-three years old, admitted to Dr. Ill's ward service at St. Barnabas Hospital, of Newark, N. J., May 10th, 1903. She has had one child. No abortions. Family

Case II.

history good. General health good. Present illness two years. Examination under ether. Hypertrophied excrescences about the anus. Ulceration of the rectum. About three inches from the anus there is a stricture of the rectum which will not allow the passage of the tip of examining finger. Excrescences removed, the resulting wounds being closed with catgut sutures. Stricture of the rectum stretched.

Patient discharged May 30th, not improved, and is now under treatment for the stricture of the rectum at my clinic at St. Barna-

bas Hospital. This patient has had no pain, and she applied for treatment only because she thought the tumors about the anus were piles, for which she ought to have treatment.

A study of these cases of esthiomène shows this disease to be a rare one, only three cases having been seen during a hospital service of twenty years. It is interesting to note the amount of destructive changes possible with the preservation of fair general health, and also the duration of the disease. The intractability of the disease to treatment may be of interest to the medical

Case III.

man, but it does not tend to increase the faith of the patient in our ability to cure the disease.

Authorities differ as to the cause. Some consider it one of the manifestations of syphilis; others think it tubercular in nature. They all agree on its resistance to treatment, and its destructive qualities. The prominence of some of its symptoms is responsible for the differences in name and definition: elephantiasis vulvæ, lupus, l'esthiomène, ulcus vulvæ, chronicum elephantiasticum, lupoid ulceration, ulcus rodens vulvæ, all apparently meaning and describing the same disease.

James P. Tuttle in his "Treatise on Diseases of the Anus,

Rectum and Pelvic Colon," describes the disease under the name of "Lupoid Ulceration of the Anus," and says: "Recent studies in pathology, however, have shown it to be only one of the many manifestations of tuberculosis. It is of a particularly aggravated form, slow in its march, yet fearfully destructive of tissues."

J. Veit, in the *Handbuch der Gynaekologie,* describes the disease under the name of "Ulcus rodens vulvae." This is one of the best descriptions of the disease I have been able to find, and I herewith give the views as expressed in that valuable book.

Case III.

I should like to prove that the diseases, ulcus rodens, elephantiasis, and tuberculosis are intimately related to each other, and still more would I like to describe this relationship. After some observations, however, and careful review of the literature covering this subject, I am unable to do so. The cases of the first named disease are on account of their rarity not as yet numerous enough. The cases of the others, on the contrary, are not always to be made use of.

Ulcus rodens is characterized by slow healing ulceration, with sharply defined edematous swellings of the surrounding tissues, and a great inclination to form fistulous tracts, which lead to

neighboring organs. Elephantiasis presents hard, circumscribed edematous swellings, frequently accompanied by papillary excrescences. Tuberculosis shows specific ulcerations with small nodules in the surrounding tissues. But, as we may find tubercle bacilli in ulcus rodens, so will we find well-marked tuberculosis with the edema resembling elephantiasis, and in elephantiasis, ulceration.

Whether syphilis or tuberculosis is the cause, or whether the skin, infected with either disease, is more easily affected by the other, is still doubtful. I consider it important to call attention to the fact that, although there appears to be no connection between these three diseases, there still seems to exist a near relationship between them. It has lately been observed that peculiar ulcerations of the vulva are associated with edematous swellings and excrescences, and that there appears to be some connection between these apparently different forms of disease. They have been described, but have not been closely observed. There are ulcerations of the urethra, which are especially found in prostitutes. The definition of the disease varies greatly in different text-books. I consider "ulcus rodens vulvae," proposed by Virchow, the best name for the disease.

The anatomical characteristics are a peculiar, sharply defined, edematous swelling associated with an obstinate ulcerative process, which is frequently found in the fossa navicularis, and the opening of the urethra, leading in the former case to recto-vaginal fistula, and in the latter to complete destruction of the urethra. It is also frequently complicated by rectal stricture. This description by Schroeder corresponds with esthiomène of the French authors. Huguier has given this name to a destructive and, at the same time, hypertrophic ulceration of the vulva, and this name is still in use in France. Pozzi calls attention to the fact that this affection lacks the destructive elements of cancer, and that there is a certain resemblance to lupus of the face, which has led to the use of the term, lupus of the vulva.

Pozzi differentiates between l'esthiomène erythemateux and tuberculeux, according to whether the ulceration be superficial and resembling lupus of the face in color, or whether the floor of the ulceration is covered by strongly proliferating granulations. While repair goes on in one part of the ulcer, ulceration goes on in another part. The hypertrophic and ulcerative form are usually combined, but each may appear separately. Pozzi also speaks of "Rectal and Vesical Fistulæ" and of strong cicatricial

retractions after healing. It is our object to show that esthiomène, lupus of the vulva, and some of the excrescences of elephantiasis are identical with ulcerous destruction of the vulva.

The etiology of these chronic ulcerations is not definitely known. The anatomical examinations show nothing characteristic. Pozzi has frequently found giant cells in the tissues, and claims that Martin and Nicolle found tuberculous masses, and several tubercle bacilli in one case. F. Koch could not demonstrate syphilis or tuberculosis. He found no giant cells, but Pinner found them. Tubercle baclli were not found by Pinner. Van Gieson found giant cells, and Unna found them in two cases. The presence of tubercle bacilli is doubtful. Cheesy degeneration, as found in tubercular nodules, has not been described, and the demonstration of tubercle bacilli has only seldom been successful. Only Martin and Nicolle speak of them. Fehling and also Küstner support the name "Lupus." v. Winckel considers the presence of giant cells as positive evidence of tuberculosis. Koch mentions a work of Riehl who found tubercle bacilli in two cases of peculiar fibromatous tumors of the anal region. He agrees with Pick, who believes in a secondary infection from tuberculosis of the rectum. We cannot ignore the possibility of a later tuberculous infection of the ulceration, but it seems positive that this is not necessary for the appearance of the disease.

Infection and traumatism will of course have to be considered important factors in the etiology of this disease. The disease is found almost exclusively in prostitutes. Schroeder emphasizes the mechanical insult of cohabitation. F. Koch considers the total extirpation of suppurating inguinal glands as a cause. A previous syphilitic infection may be admitted in most of the cases. The ulceration has lost its specific character, and is not affected by mercurials or iodides. The general health is affected but slightly. The diagnosis is difficult. The disease, however, has this peculiarity: excresences, hard, edematous swellings and ulcerations are found at the same time. The differential diagnosis between this disease and carcinoma must, in doubtful cases, be decided by the microscope.

The prognosis is not favorable. When there is considerable swelling of the labia majora with excrescences, and ulceration of the fossa navicularis, with rectal fistula and stricture, there is no hope of recovery.

The treatment is not very promising. The tumors are to be removed. The resulting wound is closed with catgut sutures,

or cauterized with the Paquelin cautery to stop bleeding and possibly hasten the process of healing.

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A PLEA FOR EARLY OPERATIVE INTERFERENCE IN CASES OF ACUTE APPENDICITIS WITH REPORT OF CASES.

By J. E. SADLIER, M.D.,
POUGHKEEPSIE.

It is not my purpose to deal with the pathology, bacteriology or symptoms of appendicitis, but rather to cite briefly the history of a certain number of cases operated upon during the acute period of the disease and endeavor by so doing to demonstrate the fact, that there is quie a considerable proportion of the number of cases of appendicitis that should be operated upon early during the initial attack; that delay in this class of cases is attended by imminent peril to the patient; that an early operation—that is, an operation done during the first thirty-six hours—is almost or quite as safe as one during the interval between attacks; that operations done late during these attacks are very apt to be attended by considerable mortality.

I fully appreciate the fact that every physician in general practice will see a large number of mild attacks of endo-appendicitis—so-called catarrhal form—and that a great mass of these cases recover rapidly without operative interference; that a saline laxative, rest in bed, and the application of an ice pack will seem to work like magic in some of these cases. Yet treating this class of case medically and having success upon these lines of treatment should not deceive us and permit of the graver forms being treated medically when early and proper surgical interference should be instituted to save the patient from the grave dangers of perforation, gangrene or extension of inflammation, thereby giving rise to general septic peritonitis. For this organ, which is of rudimentary character, with its relative increase in lymphoid tissue, and by reason of its frequently dependent position and the fact that the circulation is a terminal one not anastomosing freely with other vessels, make it especially liable to inflammatory conditions, and these conditions, when once established, are less liable

to undergo proper resolution, and are especially prone to go on to ulcerative and gangrenous states; or, when by reason of contraction or obliteration of the lumen of the tube, muco-pus, pus, foreign bodies or inspissated fecal matter contained therein, may ulcerate and perforate its limited walls and spread a virulent infection to the adjacent peritoneal cavity. As an evidence of how rapidly this condition may take place, I shall later on cite a case where upon operation a perforation was found to exist twenty hours after the onset of the attack.

The physician is always first summoned to a patient suffering from this disease and upon him devolves the responsibility of judging as to the probable severity of the attack. Upon him rests the question of outlining the plan of treatment as to whether it shall be medical or surgical. Hence his great responsibility. Unfortunately it is not always possible to estimate by the symptoms present the condition liable to be existing in the abdominal cavity. For many times do we find, when too late, that fatal changes have been taking place inside the abdominal cavity that were not shown or interpreted by the symptoms present in the case. This I shall endeavor to prove satisfactorily by the report of cases.

I would strongly urge that no opium be used in any case of appendicitis until it is positively settled that an operation is not to be done. For, undoubtedly, many lives have been lost by the injudicious masking of the symptoms by the use of opium or some of its derivatives. If the question of operation has been disposed of negatively and finally, then only is the employment of opium justifiable. The prognosis in cases of appendicitis is unfavorable in cases treated medically in proportion to the severity of the infection; in cases treated surgically, in proportion to delay in instituting operative interference. I quote from the excellent work on this subject by G. R. Fowler, who says that "the only cases treated non-operatively in which the prognosis can be said to be favorable are those in which the disease is neither progressive nor stationary, but, on the contrary, is retrogressive within the first twenty-four hours after the onset of the attack. This is best evinced by the symptom of tenderness, provided the latter has not been masked by the administration of opiates. And that the only certain thing about an attack of appendicitis which is not subject to operative treatment or in which operation is delayed, is the uncertainty of its termination." According to the same author, the modes of termination may be

(1) perforation prior to the formation of proper adhesions, thus giving rise to fatal septic peritonitis; (2) infection of the peritoneum through the lymphatics or other channels of infection; (3) the rupture of an appendicular abscess and resulting peritonitis; (4) septic complications arising from extension to an infection of the post-peritoneal connective tissue; (5) gangrenous inflammation of the appendix; (6) pylephlebitis, hepatic abscess, etc.

As evidence of the frightful rapidity with which an infection located primarily in the appendix may spread to and infect the entire peritoneal cavity, giving rise to general septic peritonitis, I will cite the three following cases all operated upon within sixty hours from the onset of the attack.

Mr. C. W., age 46, seen through the courtesy of Dr. Louis Wood; druggist, and a man of rather frail constitution, who had been subject to gastric and intestinal disorders for some years past. He was in his usual health up to and until 4 a. m., March 10th, when he was attacked by the most violent pain located in the epigastric region which he ascribed to acute indigestion, he having eaten some rather indigestible material the previous evening. He suffered continuously for the next forty-eight hours, but considered it to be due to acute indigestion, he persisted in going to his store and attending to his usual duties, taking a large quantity of morphine to relieve the pain. On the morning of March 12th, after a night of frightful agony, being unable by reason of his severe illness to get out of bed, he sent for his physician, Dr. Wood, who at once recognized a condition of developing general peritonitis originating presumably from an attack of appendicitis. At noon of the same day, I saw him in consultation; the man had an anxious facial expression, pulse of 140, distended abdomen, temperature of 103°, thighs flexed on abdomen, etc. It was evident that nothing short of operative interference would save him and that there was but little hope in that direction. Operation 2 p. m., March 12, Drs. Wood and Ward assisting. This was just fifty-eight hours from the onset of the attack. Appendix was found to be gangrenous; no limiting adhesions; abdomen half full of foul pus; extensive general septic peritonitis. Removal of appendix, abdominal lavage, liberal drainage down to pelvis. Patient was put in semi-erect position in bed to favor drainage. Rallied from operation and seemed to improve for forty-eight hours, but then he began to fail and died 3½ days after operation. This is a case where had it not been for the perverseness of the patient in per-

sisting at his work, thereby not allowing a proper diagnosis to be made in time to get an operation, a life was sacrificed. For had it been possible to have operated upon him during the first twenty-four hours of the attack, the result would have been different.

Mr. W. M., age 22, express agent; a tall, slender young man with only moderate constitution. October 28th, while at work, was taken with acute pain in the abdomen, located about the umbilicus; some nausea and vomiting. Finished his day's work and that evening called upon his physician, John S. Wilson, who found him suffering with what seemed to be a very mild attack of appendicitis. Patient was put in bed, kept perfectly at rest, and with a pulse not to exceed 76, and a temperature not to exceed 100°, some abdominal tenderness and muscular rigidity, but no severe symptoms that would indicate the necessity of operative procedure. Forty hours after the onset of the attack, I saw the patient in consultation with Dr. Wilson, and by reason of the very moderate symptoms shown in his case, although it was very evident that he did have appendicitis, I counseled non-operation. During the afternoon of October 30th, he developed severe pain, nausea, vomiting, and extreme prostration. His attending physician being out of town at the time and the nurse in attendance not realizing the importance of the change in symptoms, several hours elapsed before he was seen and the condition recognized. Then I was called and I diagnosed perforated appendix with developing peritonitis. Diagnosis confirmed by Dr. Ward. Patient had a thready, weak pulse, irregular and intermittent, almost continuous nausea and vomiting, rapidly distending abdomen, and all the evidences of collapse, with rapidly developing septic peritonitis. Patient was removed in the ambulance from his boarding place in this city to my private hospital and operated upon at once. A partially gangrenous and perforated appendix was found, general septic peritonitis with large quantities of pus and fecal matter free in the abdominal cavity. Abdominal cavity thoroughly washed out, free and extensive drainage applied, and patient put to bed in the semi-erect position. Then began a struggle to keep the patient alive which lasted over two weeks, it being necessary to do a transfusion from once to twice daily during that time, to practise gastric lavage, innumerable hypodermics of cardiac stimulants. In fact, it required the almost constant attention of physician and nurses, and the patient delirious from the toxemia and septic absorption from this foul

peritoneal cavity. But after unremitting toil, we were finally rewarded by having the patient recover. At present time he is well and strong and at his usual work,—the first and only case of general septic peritonitis that I have ever seen cured by operation, and a warning that we should not abandon these cases—doomed certainly to death if unoperated upon—without giving them the slight chance, even though very slight it be, that operative intervention affords.

Mr. R., student, age 19. Had suffered occasionally slight pain in the right iliac region during the past year. October 24, 1901, presented himself at my office with the usual symptoms of a very mild attack of appendicitis. Was placed in bed and given the usual medical treatment for such a condition, and for forty-eight hours had symptoms of such mild character, with a temperature not to exceed 99½° and a pulse not above 80, that for a matter of nearly two days it would have been considered by any physician or surgeon unnecessary or even criminal to have performed any operative procedure, and yet with these mild symptoms, a condition of gangrene of the appendix and the adjacent cecum was taking place, and the time when this young man could have been operated upon with some degree of safety passed by with only medical treatment administered by myself, and later about fifty hours after the onset of the attack when severe symptoms set in—that is, increasing pain, tenderness, abdominal distention, vomiting and irregular pulse, and the condition changed so rapidly from one of the mildest type to one of the most severe examples of this condition that it was appalling. There was some delay in getting the consent of his parents living in Indianapolis, but an operation was done about sixty hours after the onset of the attack. General peritonitis existed with complete gangrene of the appendix and gangrenous condition of the cecum, ascending colon and adjacent coils of the small intestine—a hopeless condition, from which he died 24 hours later. This is one of the cases of acute fulminating appendicitis with a condition out of proportion to the few symptoms shown—a case belonging to that class that could only have been saved by a surgeon who believes in operating upon every case of appendicitis. For certainly no man who believes that there are cases that can be saved by medical treatment would ever have dreamed that this case would require surgery. The appendix in this case contained a long inspissated fecal concretion, the cause of trouble, and it proves to us the necessity of paying close attention to the pains located

in the lower right quadrant of the abdominal cavity—such pains as this young man had suffered with for a year previous to this acute attack, pains which should have called for a proper examination and operation previous to the onset of this attack.

The foregoing three cases illustrate several important points:

First, that rapidly fatal conditions may arise in an extremely short time.

Second, that the condition inside of the abdomen may be markedly out of proportion to the symptoms shown.

Third, that it may be wise to operate upon these cases even though general septic peritonitis exists; for in this number of three cases—hopeless by medical treatment—one out of the three was saved by surgical interference.

Miss M. McC., seen through the courtesy of Dr. Cronk. Patient's age 37. February, 1902, had an attack of appendicitis from which she recovered by medical treatment, remaining well until October 13, 1902, at 8:30 p. m., when severe sharp pain in the abdomen, vomiting, rigidity of the right rectus, increase in pulse rate and temperature, etc., led the attending physician to make a diagnosis of acute appendicitis. I saw her in consultation, October 14th, at 10 p. m. She was suffering intensely, pulse 120, very weak, temperature 103°, vomiting, great pain in the abdomen, especially in the right inguinal region, intensely sensitive, right rectus rigid. Operation advised and performed October 15, 10:30 a. m., forty-eight hours after the onset. Appendix found to be gangrenous in spots, no limiting adhesions, perforation direct into the abdominal cavity, pus and infective material free amongst the coils of intestine of the right inguinal region, but as yet no general peritonitis. Appendix removed and that portion of the abdomen which was infected, wiped clean with sponges wet in salt solution, liberal drainage, elevated position in bed. Bacteriological examination of secretions from the appendix proved the infecting germ to be the colon bacillus. Patient made a good recovery, except that a fecal fistula persisted and required a secondary operation from all of which she recovered very nicely.

Augustus K., age 25, seen through the courtesy of Dr. Freston. History of repeated attacks of appendicitis, I think 14 in number, with almost constant pain in the right inguinal region between attacks, which was especially severe on any exertion or manual labor. December 21st, developed the usual symptoms of a severe attack which persisted with increasing severity for the next three

days, especially increasing tenderness. Operated upon December 24th. Appendix found intensely inflamed, swollen to the size of a man's thumb, partially adherent and curved upon itself. One spot ulcerated so that it was as thin as paper. No general peritonitis. Appendix removed and when it was opened the mucous membrane was found to be gangrenous; a gauze drainage. Patient made an uninterrupted recovery. In a letter to me recently received, he expresses himself as being thoroughly well.

Mr. I. G., age 25, seen in consultation with Dr. John H. Otis, December 22, 1902, 10 p. m., with acute appendicitis which had existed for about thirty hours. History of like pains in that locality for previous year. Seen again with Dr. Otis the following morning, December 23d, 9 a. m. During the night his symptoms had markedly increased, pulse rate, temperature, and especially the abdominal tenderness, all being remarkably greater than on the previous evening. Operation advised and performed at my private hospital 12 o'clock the same day about fifty hours after the onset of the attack. The region of the appendix was thoroughly walled off with gauze, some limiting adhesions liberated, appendix found to be intensely swollen and inflamed, gangrenous in places, and in several points so thin that it was with difficulty removed without perforation. Appendix ligated and removed, but the stump and the adjacent cecum were so swollen, thickened and inflamed that it was impossible to invert the stump. Liberal drainage, elevated position in bed, etc. Patient rallied nicely and made an uneventful recovery.

Miss Frances B., age 11, seen through the kindness of Dr. Cronk. Had been subject to intestinal colic and stomach disturbances for the past year, and during the past summer had an attack of pain, followed by tenderness in the abdomen, which was probably an attack of appendicitis. Present attack began November 1, 1902, 10 p.m., with usual symptoms of a severe attack of appendicitis. Seen in consultation November 2nd. Diagnosis confirmed, and by reason of severe symptoms existing, an operation was advised and performed the following morning, November 3rd, about forty hours after the onset of the attack. The organ was found to be very much swollen; limiting adhesions not very extensive. The appendix removed and upon incision the proximal part of the mucous membrane was found intensely ulcerated and eroded; while the lumen of the distal half of the tube was distended with blood clot—altogether a very much diseased, swollen, thickened and dangerous appendix, and one

which by early and radical operation removed a great source of danger to this patient. Patient made an uneventful recovery.

Mr. E. M., referred by Dr. Stephens, of Gardner, N. Y. A man with an exceptionally good previous history. No history of colic or intestinal disturbances of any character whatsoever until the morning of September 4, 1902, when he was taken suddenly ill with severe pain in the right iliac region. There was nausea, vomiting, increased pulse rate, some increase of temperature, upon which basis a diagnosis of appendicitis was made by the attending physician. I saw him in consultation the first time September 9th. His temperature was ranging from 100 to 103°; pulse about 100. There was a board-like rigidity in the right iliac region, very tender. Had had some irregular chills and chilly sensations. Diagnosis of appendicular abscess. Operation advised and performed the afternoon of the same day. About four ounces of pus evacuated. Appendix not removed (explanation). Patient made an uninterrupted recovery.

Mr. J. C., has been a sufferer for the past two years with attacks of pain in the abdomen, with tenderness in the right iliac region and the usual symptoms of appendicitis. These attacks had been sufficiently severe to keep him in bed, varying the length of time from a few days to several weeks. During the intervals he was unable to continue his usual vocation by reason of the suffering it excited when he exercised to any considerable extent or did any manual labor. Operation had been advised a number of times, but rejected by the patient. This patient was a resident of Norwich, Connecticut, and the latter part of April, 1902, while visiting in Poughkeepsie, he suffered one of his recurrent attacks. It was especially severe, with rapid pulse rate, marked tenderness in the right iliac region and very severe pain. An operation was advised and accepted. A very long appendix, very much inflamed, twisted upon itself, and buried in adhesions of recent as well as of long standing found to exist. Appendix removed, and it was found to contain a concretion, the evident cause of the trouble. This patient made a nice recovery and returned to his home two weeks after the operation.

Willie S., age 14, seen through the courtesy of Dr. Cronk. A perfectly healthy young lad, who had been free from any symptoms of a gastric or intestinal character up to and until date of present attack, hence no evidences of any preexisting attack of appendicitis. April 5, 1902, at 2 p. m., while at school, patient was taken with severe pain in the abdomen, nausea, vomiting, etc.

Was taken home and that evening seen by Dr. Cronk, who made a diagnosis of acute appendicitis. The following morning, April 6th, I saw this patient in consultation. He showed all the symptoms of an acute attack of appendicitis of a moderate grade, but one feature in his case was to me rather startling, and that was that he had a very rapid pulse rate ranging from 110 to 120. Considering the early stage of the attack and the comparative freedom from danger at such a time and the possible considerable danger considering the pulse rate, abdominal tenderness, etc., from any delay in surgical interference, I advised immediate operation. This was accepted and the patient operated upon just twenty hours from the onset of the attack. The appendix was found very much inflamed and perforated. A fecal concretion projected directly through the wall of the appendix into the free peritoneal cavity, *and was not walled off by adhesions, no limiting adhesions whatsoever.* Appendix was removed, adjacent parts of intestine wiped clean with salt sponges, and wound closed with a light gauze drainage. Patient made an uninterrupted recovery, barring a slight sinus which existed for some time after he was up and about, but which finally closed. This case is instructive in several points; *first,* the diagnsotic importance of the pulse; *second,* the necessity for rapid and speedy surgical interference in all cases showing marked symptoms at the onset; *third,* the rapidity with which perforation may take place.

Mr. G. I. L., seen in consultation with Drs. J. C. and J. H. Otis. A case of acute appendicitis with no history of previous attack; pain very severe at the onset, and characteristic symptoms of a decided character. These symptoms were all retrogressive after the first twenty-four hours, and it was deemed by the attending physician that an operation was not necessary. About that time I also saw him in consultation and considered it was unnecessary to interfere surgically. His symptoms improved up to a certain point and then seemed to remain stationary with the patient about half well, that is, after the first week he still had a tenderness of a moderate degree, slight pain, and an afternoon rise of temperature from one-half to one degree, hence the necessity for keeping him absolutely quiet in bed. These symptoms continuing and as it was very important that this man should be at his business as soon as possible and not be handicapped by recurring attacks of appendicitis, it was agreed to remove the offending organ. This was done November 18, 1901. The appendix was found in a state of semi-acute inflammation and removed.

The central cavity of the appendix was almost obliterated by an inflammatory condition. He made a perfect recovery.

E. W., age 7. Seen through the kindness of Dr. Cronk. His first and only attack of appendicitis began November 8, 1901, with the usual symptoms which gradually grew more intense, that is, more pain, more tenderness together with increasing rigidity of the right rectus. Seen in consultation November 10, 10 p. m. Diagnosis confirmed, and by reason of the increasing severity of the disease operation was advised and performed the following morning, November 11th. Appendix found to be only slightly adherent, intensely swollen and inflamed, with several quite large areas of gangrene and the adjacent cecum the seat of three gangrenous spots, developing peritonitis. The appendix removed, the gangrenous spots in the cecum were closed in by Lembert sutures, the adjacent coils of intestine wiped dry and the wound closed. This patient was frail and had a marked degree of toxemia, so that for the first two days following the operation, it was questionable as to his recovery. He then rallied nicely and was discharged cured after three weeks.

Mr. B. C., age 32, seen through the courtesy of Dr. J. C. Otis. Had always enjoyed good health except for an occasional so-called bilious attack, which was always accompanied by severe pain in the right side of the abdomen, but not severe enough for him to call a physician. November 2, 1901, was taken with severe pain in center of abdomen, vomiting, some fever, increased pulse rate, rigidity of the right rectus, etc., upon which symptoms his attending physician based his diagnosis of acute appendicitis. I saw him in consultaton, November 4th. I found the abdominal wall over the right inguinal region rigid, board-like; respiration thoracic in character; extreme tenderness in the region of the appendix; temperature 103°; pulse rate in proportion. Diagnosis of developing appendicular abscess made. Operation November 5th, three days from the onset of the attack, disclosed appendicular abscess which contained about one pint of pus. Patient made a good recovery.

D. W., age 19, student. No history of tuberculosis in the family. Patient a rather overgrown and frail-looking person. During the summer of 1901 complained of pain in the right side of the abdomen for which he received no medical treatment or advice. September 27th, whilst on his way from Poughkeepsie to New York, he was taken with severe pain in abdomen referred to the epigastric region. Upon reaching New York he immediately

went to a hotel and summoned a physician and remained under his care for three days, during which time he suffered severely from what the attending physician called intestinal colic. Returned to Poughkeepsie September 30th, three days after the onset of the attack. I then saw him. Diagnosed appendicitis, although in this case the pain, and especially the tenderness did not localize itself as well as it does in most cases of appendicitis. I treated him medically until October 7th, when the symptoms all becoming intensified, I, after consultation with Drs. Wood and J. S. Wilson, deemed an operation necessary. Upon opening the abdomen, we found that we had to do not only with an appendicitis, which evidently was a secondary condition and tubercular in character, but there was a general condition of tuberculosis of the peritoneum and mesenteric glands of the right half of the abdominal cavity. The appendix as well as several of the large mesenteric glands were removed. After irrigation with salt solution the wound was closed. The patient made a nice recovery and, strange to say, his temperature dropped to normal shortly after the operation; his pain as well as the tenderness all ceased, and he returned to his home in Vermont seemingly very well. During the summer of 1902, whilst I was out of town, he called at Poughkeepsie and was seen by the nurse who had him in charge at the time of his operation. He reported to her that he was in perfect health, had no abdominal pain or tenderness and had gained some 30 lbs. in weight since the time of operation. The diagnosis of tuberculosis of the peritoneum and appendix in this case was confirmed by Dr. Ward, Pathologist.

R. M., age 17, seen through the courtesy of Dr. LeRoy of Pleasant Valley. Was taken with an acute attack of appendicitis October 23, 1901. For several days his condition seemed to be stationary or retrogressive. He then developed chilly sensations, increasing temperature and increasing pulse rate which led the attending physician to suspect formation of pus. In consultation, I felt justified in confirming this diagnosis and upon operation a large appendicular abscess was found. The temperature dropped to normal the second day after the operation and the patient made an uninterrupted recovery.

W. M., age 28. machinist. Seen through the courtesy of Dr. D. M. Sheedy. No history of previous illness of any importance. July 1, 1901, developed an attack of acute appendicitis, which was so diagnosed and treated by the attending physician, but the symptoms not being of severe character and seeming to im-

prove after the first two days, he was treated medically. Later an increase in temperature and the formation of a tumor in the right iliac region led the attending physician to diagnose appendicular abscess. I saw the case in consultation with Dr. Sheedy, confirmed his diagnosis, and advised operation. Localized pocket of pus was found in which was a gangrenous appendix which was completely amputated from its attachment to the cecum. The temperature dropped to normal shortly after the operation, but for ten days a fecal fistula existed. This gradually closed, leaving only a small sinus which existed for a couple of months and finally closed.

Leonard L., age 11, seen through the courtesy of Dr. Lamoree. Developed symptoms of a typical attack of appendicitis, May 4, 1901. Under medical treatment he did very nicely for several days, or at least seemed to do well, but latterly developed a tumor in the right inguinal region. Some chills and increased temperature led to my being called in consultation. We operated and evacuated a considerable quantity of pus in which was found a completely detached gangrenous appendix. The patient made an uninterrupted recovery.

Mrs. J. C., age 57, widow. During March, 1902, this patient commenced to have pain in the right inguinal region, no sudden onset, but rather a gradually developing condition with pain increasing upon exercise and an inability on her part to lie upon the left side. She paid no attention to this condition for a couple of months and then applied for admission to a general hospital. She was admitted, examined, and a diagnosis of spinal irritation was made. She remained in the hospital but a short time—a matter of a couple of weeks—and left unimproved. She then remained untreated for several months, the pain growing gradually more severe during that time. There was considerable obstinate constipation associated with her case, and this in conjunction with the steadily increasing pain, together with the fact that relatives had died of cancer, led this patient to believe that she had malignant disease of the intestine and if so, she did not care to have anything done; hence her delay in seeking the advice of a physician. During October, 1902, I was called to attend her. This was eight months from the onset of the trouble. On palpation in the right inguinal region, I found a very tender body, seemingly about the size of an English walnut. It was in the region of the appendix normally placed and the entire right inguinal region was fairly tender on pressure. I hesitated in

diagnosis as between chronic appendicitis and malignant disease, rather leaning toward the latter. An endeavor was made to settle the diagnosis by means of an X-ray picture, hoping that if malignant disease existed it would show in the picture; but the abdominal walls were too thick to allow of such a result. The pain began to increase and during the last week of November the patient began to suffer symptoms of sudden, acute appendicitis, the agony being something very extreme. An operation was then agreed to, and assisted by Dr. J. S. Wilson and Dr. Mann, I operated on her December 2nd. Found a most unusual condition. The proximal end of the appendix for about one inch was perfectly normal; it then expanded, and the remaining portion for about three inches was club-shaped and easily the size of a large thumb. The surface was eroded, very much ulcerated, and projecting in numerous places through the thin walls of this ulcerated appendix were calcareous deposits. The mesoappendix was inflamed and degenerated. In fact, we had to do with a case of chronic gouty appendicitis, upon which was engrafted an acute attack. The adjacent coils of intestine had been irritated by the sharp points of calcareous matter sticking through the appendix and had been infected the last day or two from the acute inflammatory condition. At the extreme distal end of this appendix and lying amongst the coils of the intestine was a mass of colloid material having about the appearance and consistency of lemon jelly and in quantity, I should say, perhaps about four ounces. The patient rallied well from the operation, but the infection spread and she died of general peritonitis a few days later. Another example of how life might have been saved had I or the other physician when in charge of the case previous to me, done an exploratory operation early in the disease when there were symptoms sufficient to warrant it—yet no severe acute condition.

And yet in this case it was perhaps the patient herself who had most to do with the delay.

Miss J. M. C., age 24. Operated upon during March, 1903. Symptoms of acute appendicitis of rather severe grade. Operation within forty-eight hours. Acute appendicitis found to exist. Appendix very much swollen, very few limiting adhesions. Appendix removed. Wound closed without drainage. Uninterrupted recovery.

Mr. J. R., prominent cutlery manufacturer of Walden, N. Y., Saturday, April 4, 1903, 10 p. m., developed severe pain in the epigastric region, which later localized itself in the right inguinal

region; severe vomiting, increased pulse rate, slight rise in temperature, abdominal rigidity, tenderness over the appendix, led the attending physician, Dr. Brownell, to diagnose acute appendicitis. The symptoms steadily increasing in severity during the following day, Sunday, led the attending physician to believe that it was an operative case, and I was called in consultation Monday. There was no question as to diagnosis, and we believed from his symptoms and from the distending abdomen that general peritonitis was developing. Operation advised and performed about forty hours from the onset of the attack. Acute appendicitis existed. No limiting adhesions; no perforation or gangrene. The parietal and visceral layers of the peritoneum of the right half of the abdomen were intensely congested—really a developing condition of peritonitis from infection from the walls of the appendix. Patient rallied well from the operation and recovered.

In reporting this number of cases, I have cited the histories only of those operated upon during the period of acute inflammation and have not reported cases operated upon for chronic appendicitis or for recurrent appendicitis where the interval operation is the one performed My reason for selecting this acute form of the disease and its operative treatment is that I believe that many lives could be saved by radical and early surgical intervention, and that we should not take the risk incurred by treating a severe case or a moderately severe case medically, but should remove the appendix during the early stage of the disease, when an early, safe operation can be done.

WM. ELIAS BROWNLEE DAVIS, M.D.

Born November 25, 1863. Died February 24, 1903.

In Memoriam.

WILLIAM E. B. DAVIS, M.D.

By L. S. McMURTRY, M.D.,
LOUISVILLE.

THE Fellows of this Society compose a band of busy workers, joined together by similarity of experience, common ambitions, congeniality of taste and earnestness of purpose. Limited in numbers, our annual reunions increase the bonds of personal attachment and mutual esteem. The element of sadness only intrudes itself when the annual roll-call shows that some familiar face is missing. Indeed, our assembling together after the lapse of a year is not unlike that of a regiment after battle.

One year ago to-day Dr. William E. B. Davis, an honored Fellow and ex-president, met with us in perfect health and vigor, in the prime of early manhood, and, with characteristically active body and restless mind, participated in the proceedings throughout the entire meeting. No man enjoyed a more honorable career; no one had brighter prospects for years of useful and enjoyable service. Much earlier than is customary in our profession, he had attained the fruition of his hopes; he was a recognized leader in scientific accomplishment; enjoyed the respect of his professional brethren in a remarkable degree, and possessed a large and devoted *clientèle*. He lacked at the time of his death eight months before reaching the age of forty years. His ability, his energy, his incessant activity, his enthusiasm and capacity for concentration of thought and labor had placed him in the line of demonstrated success and authority at an age when the members of our guild are usually only beginning to receive merited recognition. He was spared the distress and suffering of protracted illness, and was killed instantly by accident at a railway crossing in the city of his home, on February 24, 1903. In the twinkling of an eye his life went out, his restless brain ceased its function, his generous heart was stilled, and his busy hands were folded for the long rest.

William Elias Brownlee Davis was born at Trussville, Jefferson County, Alabama, November 25, 1863. Both his father and

grandfather were physicians of good attainments and excellent repute. His academic education was acquired at the University of Alabama, and after attending medical colleges in Louisville and New York, he received his degree from the Bellevue Hospital Medical College in 1884. He at once entered upon the practice of his profession in partnership with his brother, Dr. John D. S. Davis, and continued that relationship until his death.

A few years after receiving the doctorate degree he made a visit to Europe and carefully observed the methods of study and practice in the medical centers of Great Britain and the continent. Upon his return home he threw all his energies with characteristic enthusiasm into his professional work. It was a time of great activity and marvelous changes in surgery. The epoch-making discoveries of Lister, the brilliant surgical achievements of Lawson Tait, were making a revolution in surgery and advancing its possibilities beyond the expectations of all former times. Dr. Davis was deeply imbued with the scientific spirit and actively set himself to work with a view of mastering the new surgery and to carry forward still further the great acquisitions of modern masters in surgical science and art. Without private fortune, he won his living by daily work as a practitioner, and devoted himself also to close study and experimental investigation. He was especially attracted to the field of gynecology and abdominal surgery, and after a few years of practice in general medicine and surgery devoted himself exclusively to gynecology and abdominal surgery. An indefatigable student, possessed of excellent judgment and discrimination, he applied the test of practical experience to all new methods and was quick to adopt the true and eliminate error. He made numerous important contibutions to surgical literature, and contributed valuable knowledge to the surgical treatment of intestinal lesions and hepatic diseases as a result of experiments upon the lower animals, which he carried on for several years in conjunction with his brother. He mastered the intricate technique of gynecology and abdominal surgery, and soon became one of the most successful operators in his section of the United States. He combined in a remarkable degree the knowledge of the scientific student and clinician. He was aggressive in his surgical work, but was governed at all times by that sound and deliberate judgment which guarantees conservatism. As a practitioner he was eminently equipped for popularity and success. He had no studied manner and indulged in no subterfuge or pretense; his bearing was straightforward,

sincere, and earnest, winning at all times the confidence and appreciation of those who entrusted themselves to his care. No one capable of appreciating him could be thrown with him without realizing his honorable nature and generous unselfish disposition. He loved his work and gave all his time to it. He was in every sense of the word a self-made man. He acquired no position or advantage by accident, but everything he had was gained by hard work. He was eminently practical, and his views on scientific subjects were always thorough, lucid and conservative. He was self-reliant, and had, with the aid of his brother, acquired the knowledge of an original investigator and expert clinician far away from the medical societies and hospitals of the great medical centers of our country.

Graduating in 1884, Dr. Davis became a member of this Society in 1889. His first contribution to our Transactions was made in 1890, when he took an active part in the discussions He contributed a valuable paper to the Toronto meeting entitled, "Restoration of Intestinal Continuity without Mechanical Devices." At the meeting in 1900 he was elected President of the Association and presided over the meeting at Cleveland. He was for several years a member of the Council, and was at all times prompt in attendance and active in the interests of the Association.

Soon after being admitted to practice in Birmingham, he realized the great necessity for a purely scientific organization for the advancement of surgery and gynecology in that section of the United States. There were no organizations devoted to surgery and gynecology especially to which the profession of that section had access. The special societies of national scope held their meetings exclusively in the East, and Dr. Davis realized the necessity for a local society which would attract leading members of the profession and afford them facilities for keeping up with the rapid advances in modern surgery and gynecology. With this purpose in view, he organized in his office the Surgical and Gynecological Society of Alabama. His enthusiasm was not encouraged by the profession of his state, and he then conceived the purpose of going beyond the confines of his own state and establishing the Southern Surgical and Gynecological Association. The achievements of this organization will remain a lasting monument to the energy, self-sacrifice, and masterful ability of its founder and secretary. He served as secretary of this organization continuously without compensation until two

years ago, when he resigned that office and was by acclamation elected its President. The members of this Association responded to the call of their worthy and popular colleague, and lent their powerful aid in the work of this organization. Meeting in the large cities of the Southern states, papers of the highest scientific value were annually presented and discussed by men from all sections of this country. In this way many younger men in the South were brought forward and stimulated to new and ever increasing endeavor. It is a high tribute to the founder and active executive officer, our deceased friend, that the Society attained such efficiency and renown, and the volumes of its Transactions will ever remain a splendid monument to his memory.

Dr. Davis was one of the organizers of the Birmingham Medical College and filled with eminent success the chair of Gynecology and Abdominal Surgery in that institution. In conjunction with his brother, he founded and conducted a large private surgical infirmary, where he did the greater part of his surgical work. He was on the staff of other hospitals in Birmingham, but was the active head of this infirmary to which he devoted the most earnest labor and constant solicitude.

In conjunction with his brother, he founded and edited the *Alabama Medical Journal,* which remains, under the editorial management of Dr. LeGrande, one of the leading exponents of our profession in the Southern states.

Dr. Davis was the recipient of notable honors from his professional brethren in all parts of the United States. He was an honorary member of the Medical Society of the State of New York; an Honorary President of the Section of Gynecology and Abdominal Surgery of the first Pan-American Medical Congress in 1893, and one of the Vice-Presidents of the Second Pan-American Medical Congress in 1896. He was President of the Tri-State Medical Association of Alabama, Georgia, and Tennessee in 1891.

The limits of this article will not permit an enumeration of all his contributions to medical literature, which were numerous and valuable. He was constantly studying new methods and striving to work out complicated problems in surgical pathology and technique. His most noteworthy contributions relate to the surgery of the liver, gall-bladder and ducts.

His life was very busy, and to his profession he gave all his time and energies. In his daily life he was temperate in habit, polite in manners, and chaste in conversation. He had a high moral character, which inspired and controlled his daily life. He

was a devoted son and thoroughly gentle, kind and unselfish in all his relations in life.

Dr. Davis was married in August, 1897, and came with his charming bride to the meeting of this Association held that year at Niagara Falls. The surviving relatives are the widow and two lovely little girls, and his brother already alluded to in this article, who has been throughout both a devoted brother and constant professional associate.

In this brief and imperfect sketch I have endeavored to record an outline of the character of an earnest, honest, able and intense man, who, dying before the age of forty years, had done the work usually encompassed in a good long life. To those here assembled he was much more than I have described. He was our colleague, our fellow, a leader among us, respected, trusted and beloved. He achieved success in many ways. His memory will be revered and cherished in his home by the loved ones there, and his name and fame will remain with the people of the city which was his home in his native state. The statesman and soldier leaves his monument in bronze and stone; the man of wealth in the colossal fortune that perpetuates his name; the author and poet in pages of thought and songs that live; but our distinguished Fellow who has joined the silent majority and whose memory we will cherish and honor, has a thousand monuments in the hearts of those who knew his good offices and appreciated his generous character.

In Memoriam.

DONALD MACLEAN, M.D., LL.D.

By WILLIAM WARREN POTTER, M.D.,
BUFFALO.

THE sixteenth year of the life of this Association is marked by the loss of several prominent Honorary and Ordinary Fellows, one of the most distinguished being Donald Maclean, of Detroit. His death was sudden and the shock it caused has been likened to that produced when a giant oak falls in the forest. In this place it is scarcely possible to pay appropriate tribute to the life and character of a man whose career was so distinguished and who left behind so much of value to perpetuate his memory. The purpose is rather to place on record the salient features of Dr. Maclean's life in a permanent form for reference by those interested, and as a model for guidance in professional life.

Donald Maclean was born December 4, 1839, at Seymour, Ont. His father, Charles Maclean, was the son of an Edinburgh lawyer, and at the age of twelve accidentally lost his eyesight. His mother, Jessie Jane Campbell, was the daughter of Captain Colin Campbell, of Argylshire. At the age of six Donald was taken to Edinburgh, where, during the next six years he attended the famous Oliphants' school for boys. At the age of twelve he returned to Canada and attended the schools at Coburg and Belleville, and four years later entered the academic department of Queen's University, at Kingston. After completing a course in the university he taught school in country districts in order to earn money to prepare himself for his life's work. In 1858 he returned to Scotland, and entered the medical department of Edinburgh University. While in that city he resided at 21 Albany Street, in the old homestead which had been occupied by the Macleans for over two hundred years. During his student days he paid especial attention to anatomy and pathology, which doubtless laid the foundation for his success as a surgeon.

After four years of hard work he received the doctorate degree,

DONALD MACLEAN, M.D., LL.D.,
Major and Chief Surgeon of Division, 1898.
Born December 4, 1839—Died July 24, 1903.

and in recognition of his ability he was appointed one of the house surgeons in the famous Royal Infirmary. Later he became an assistant to Prof. Syme, the eminent Scotch surgeon. In 1862 he returned to Canada, and in January of the next year came to the United States and received a commission as assistant surgeon in the army. He served in the general hospitals in St. Louis, Harrisburg, Louisville, and New Albany, Ind. In the latter part of 1864 he returned to Kingston where he became professor of surgery in Queen's University. During these early years, while yet almost a youth, he acquired a large practice and gained an enviable reputation as a teacher and writer. In 1866, by request of Prof. Syme, he edited an American edition of Syme's surgery, which was well received by the profession in this country. In 1872 he was appointed professor of surgery in the University of Michigan, where, he has often stated, he spent the best years of his professional life. His career and record, and what he did to advance the medical department of the University of Michigan are known to the profession of that State. In 1889, because of an irreconcilable difference with the Faculty, he resigned his professorship in Ann Arbor and removed to Detroit, where he built up a large consulting and surgical practice.

In 1893 Queen's University of Kingston conferred upon him the degree of LL.D., which honor has been given to but twelve men within fifty years. He was surgeon-in-chief of the Michigan Central and Grand Trunk railroads for upwards of twenty years. He was President of the Michigan State Medical Society in 1884, and of the Detroit Medical Association in 1887, and was an honorary member of the medical societies of New York and Ohio and of the British Medical Association. In 1894, at the San Francisco meeting, he was elected President of the American Medical Association. During the Spanish-American War he received a commission as major, and served as chief surgeon of division at Fortress Monroe, Va.

His contributions to medical literature were numerous: besides the already mentioned American edition of Syme's works, his clinical lectures were a main attraction to the readers of the *Physician and Surgeon* for many years. Other works of his pen are: "Memoranda, Surgical and Pathological" (*Transactions* Medical Society of the State of New York, 1893), "A Few Living Issues Affecting the History of Medicine" (President's Address, American Medical Association, 1895), "James Syme the Surgeon" (*Medical Age*, 1893), "Treatment of Fractures," etc.

At the Toronto meeting of this Association, in September, 1894, Dr. Maclean was elected an Honorary Fellow. He was present and participated in many of the debates on that occasion. He was a ready speaker, forceful in manner, succinct in style, and presented his thoughts with logical sequence and finished diction. For many years Dr. Maclean was distinguished as a leading surgeon in Michigan, a position which he held even until his latest days. His reputation was national in its scope and international in its fame.

The human side of Dr. Maclean's life was strong; he was a man among men and enjoyed the social amenities of everyday life. He was fond of his colleagues and delighted in the companionship around the dinner table and in the banquet hall, where, with anecdote and speech, he lent a charm that was rarely equaled. His memory will ever remain green in that wide circle of personal friends in which he was a conspicuous center.

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